MILL LAKE DAM PROJECT 2005

ENVIRONMENTAL ASSESSMENT

Bitterroot National Forest
Stevensville Ranger District
Ravalli County, Montana

MAY 2005

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The reports cited in this EA can be obtained from the project planning record located at the Stevensville Ranger District Office in Stevensville Montana. Additional supporting project documentation for this and other dam projects (Canyon and Wyant Lake Dams, Tin Cup Lake Dam and Bass Lake Dam) can be obtained from the Bitterroot National Forest website (http://www.fs.fed.us/r1/bitterroot/planning/forest_index_planning.htm).

PURPOSE AND NEED FOR ACTION

INTRODUCTION

The Forest Service has prepared this Environmental Assessment (EA) to determine whether or not an Environmental Impact Statement is necessary for the proposed Mill Lake Dam Project.

Overview

The Forest Service proposes to authorize Mill Creek Irrigation District (MCID) access to their easements at Mill Lake Dam, with certain terms and conditions, so that MCID may make these facilities safe, consistent with their responsibilities under federal dam safety laws and regulations and consistent with their rights and responsibilities under terms of their easements.[1] The Forest Service would authorize sufficient helicopter access to allow for the work to be done safely and effectively during the 2005 field season. The remaining access would be via stock or foot travel on Trail 364.

The purpose and need for the project stems from Mill Creek Irrigation District's existing rights and obligations to maintain Mill Lake Dam consistent with federal dam safety standards and other pertinent laws and regulations which also govern MCID's use of their easement and the protection of National Forest System lands.

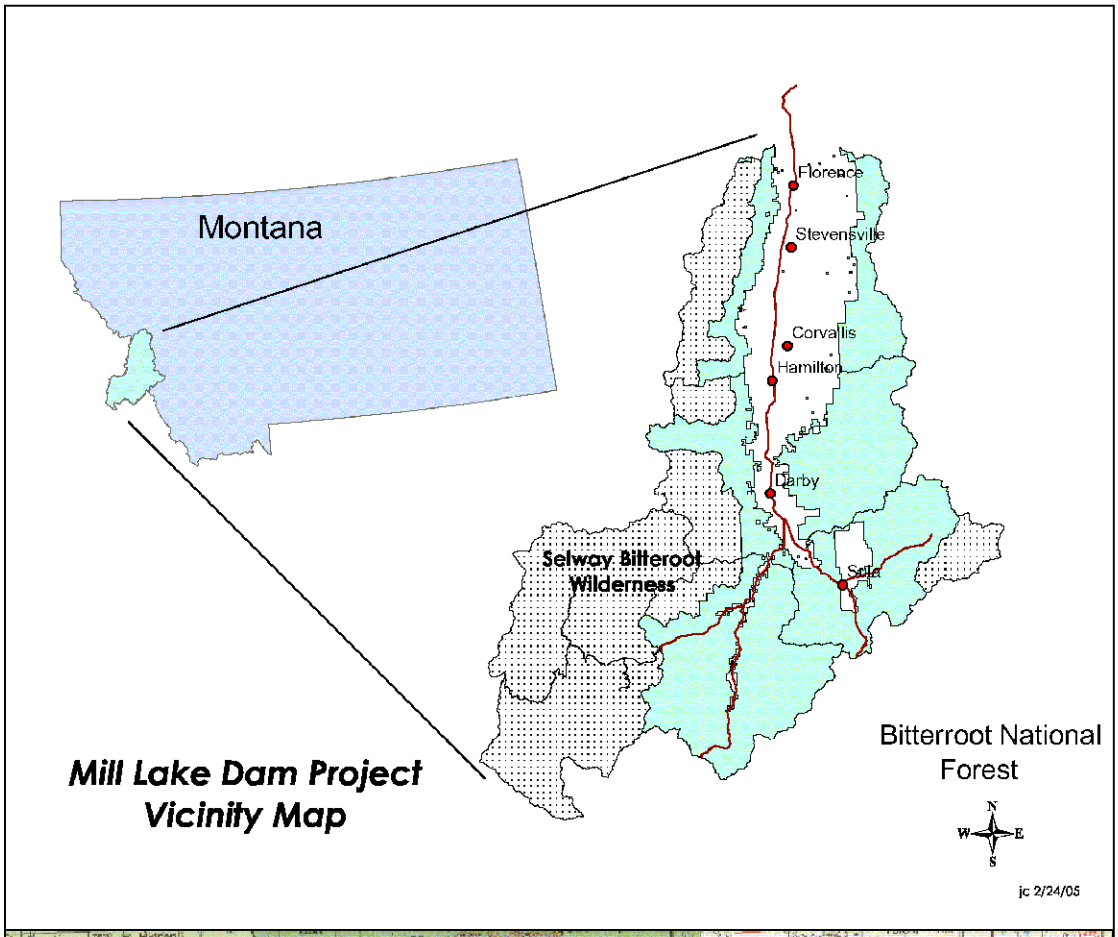
Mill Lake Dam is owned and operated by Mill Creek Irrigation District (MCID). MCID has requested access to their easements at Mill Lake Dam on the Bitterroot National Forest, Stevensville Ranger District. The irrigation district has authorized occupancy to maintain and operate these dams on National Forest Lands under valid pre-Forest easements recognized under the Act of 1866 granted by the Secretary of the General Land Office/ Department of Interior. (Appendix D). This easement is entirely within the National Forest boundary as well as within the Selway Bitterroot Wilderness.

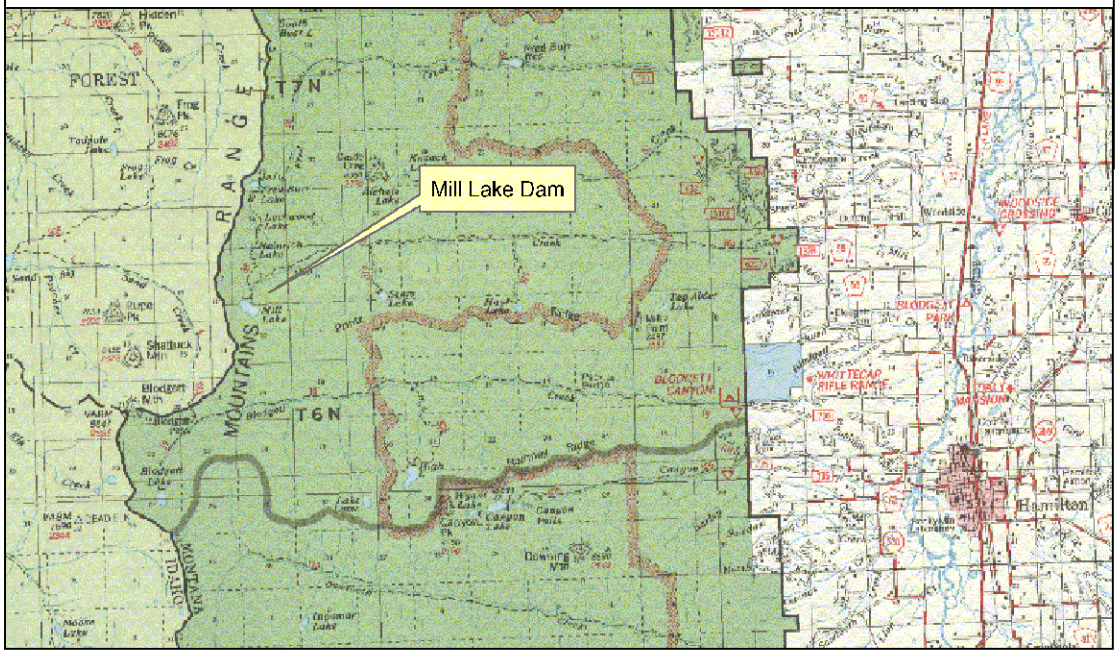
Mill Lake Dam is classified as a high hazard dam, and this classification is based on the potential consequences if the structure failed. Several residences are located within the dam breach inundation area, and therefore, a dam failure would likely result in loss of human life or excessive economic loss. The hazard classification is based on the potential results of a dam failure. This hazard classification elevates the associated risks of failure, and therefore, timely completion of the work is critical.

As the dam owner, MCID is responsible for repair and maintenance of Mill Lake dam. This dam currently has deficiencies that the MCID must correct to comply with the dam safety laws and regulations. Please refer to Appendix B for a description of the condition of Mill Lake Dam and MCID's proposed work on those dams.

[1] Refer to Appendix A for a list of the authorities through which the U.S. Forest Service regulates dams on National Forest lands.

Mill Lake Dam Vicinity Map - Map #1





Background

Mill Lake Dam is located in the south half of the southwest quarter of Section 1, Township 6 North, Range 16 East, P.M., which is approximately 15 miles west and one mile south of Corvallis, Montana. The dam is located approximately 10.5 miles inside the Selway-Bitterroot Wilderness boundary at the head of Mill Creek. Public access to Mill Lake is by Trail No. 364. Distance to the lake from the trailhead is approximately 13 miles (Also see Map 1).

This dam is currently classified as a high hazard dam and stores 780 acre-ft of water at the spillway crest. The dam dimensions are approximately 25 feet high and 450 feet long. It was originally constructed in 1895 with reconstruction in 1907. Mill Lake Dam is owned and operated by the Mill Creek Irrigation District.

PURPOSE AND NEED

The purpose of this proposal is to authorize MCID adequate access[2] to their facilities and to prescribe terms and conditions related to this access and their subsequent work on the facilities as necessary to protect the National Forest.

The Forest Service is required by both the Wilderness Act[3] and the Alaska National Interest Lands Conservation Act[4] (ANILCA) to authorize access to valid occupancies such as these easements held by the MCID. Therefore, the authorization of adequate access to MCID for the valid use of its easements is non-discretionary.

In this case, the Wilderness Act also requires the Forest Service to "prescribe the routes of travel to and from the surrounded occupancies, the mode of travel, and other conditions reasonably necessary to preserve the National Forest Wilderness". As such, the Forest Service has the responsibility to set reasonable terms and conditions on that access as necessary for protection of the National Forest.[5]

These acts prescribe a narrow scope to the Agency's discretion, balanced between requirements to allow for the proponent's rights and responsibilities pertaining to the use of their easement and the Agency's responsibility to provide protections for National Forest and Wilderness values.

A number of factors help define and narrow the Agency's discretion in this case, and therefore they also define the scope and purpose of this proposal and are discussed further below.

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[2] Defined at FSM 2320.5.15 as "The combination of routes and modes of travel that the Forest Service has determined will have the least-lasting impact on the wilderness resource and, at the same time, will serve the reasonable purposes for which State or private land or right is held or used."

[3] Wilderness Act, Sec. 5(b); codified at 16 U.S.C § 1134; and the implementing regulations at 36 CFR 293.13 Access to Valid Occupancies.

[4] ANILCA, Pub. L. 96-487, title XIII, Sec. 1323; codified at U.S.C. § 3210

[5] Concomitantly, the Forest Service also has authority under its general grant from Congress to protect the National Forests (16 U.S.C. § 551) to regulate reasonably the easement in order to achieve the purposes for which the national forests were reserved, and the Selway-Bitterroot Wilderness was designated.

Mill Lake Dam has structural deficiencies of the outlet works pipe that MCID must correct. The nature of known deficiencies, the downstream risks, and uncertainties associated with the internal structure and integrity of these older dams increase the urgency that known deficiencies be corrected as soon as possible. See Appendix B for a discussion of known deficiencies in Mill Lake Dam.

At the end of each field season, it is important that any corrective measures, including erosion control and armoring of the embankment, be completed to the extent that the dam can withstand the following winter conditions and spring runoff or precipitation events.

MCID has requested access to their Mill Lake facility so they may perform work necessary to repair the deteriorated outlet pipe and correct the deficiency before it develops into an emergency condition. This course of action is for the purpose of meeting MCID's responsibilities under dam safety laws and regulations.

The Forest Service has reviewed the MCID's preliminary technical proposal and request for access and has determined that:

1. The MCID's proposed use is consistent with the purpose, terms and limits of the easement. Act of 1866, Section 9 states: "And be it further enacted, that whenever, by priority of possession, rights to use of water for mining, agricultural, manufacturing, or other purposes, have vested and accrued, and the same are recognized and acknowledged by the local customs, laws, and decisions of the courts, the possessors and owners of such vested rights shall be maintained and protected in the same; and the right of way for the construction of ditches and canals for the purposes aforesaid is hereby acknowledged and confirmed. (Appendix D).
2. Review of the preliminary technical plans indicates the final plans could meet requirements under dam safety laws and regulations.[6]
3. Based on preliminary environmental review by the interdisciplinary team, it appears the irrigation district's proposed plans are, or could be made consistent with environmental laws.[7] The interdisciplinary team developed the proposed terms and conditions based on this preliminary environmental review (p.8 to 9).
4. A minimum requirements process was used to assist with the analysis of MCID's request.[8] The process indicates the proposal would meet Forest Service Manual 2326.1 conditions under which use of motorized equipment and/or mechanical transport would be allowed within wilderness [9] (Appendix F).

[6] The Forest Service is the agency responsible for regulating this dam under the current dam safety laws and regulations. In this role, the agency reviews and approves (or disapproves) the irrigation districts engineering plans. The plans must meet strict dam engineering standards, considering, amongst other things, design, choice of materials, methods of placing materials, and the risks and uncertainties inherent in the existing structure. It is the irrigation district's responsibility to develop the engineering plans.

[7] These include the Clean Air Act, Clean Water Act, Endangered Species Act, Historic Preservation Act, National Forest Management Act, etc.

[8] The Minimum Requirement Decision Process was developed by federal agencies to help provide consistency to the way project proposals in wilderness are evaluated. This decision guide is a means to document the analysis process.

[9] Forest Service Manual, 2326.1 – Conditions Under Which Use May Be Approved. Allow the use of motorized equipment or mechanical transport only for: 1. Emergencies where the situation involves an inescapable urgency and temporary need for speed beyond that available by primitive means. Categories include fire suppression, health and safety, law enforcement involving serious crime or fugitive pursuit, removal of deceased persons, and aircraft accident investigations.
4. Access to surrounded State and private lands and valid occupancies (FSM 2326.13).

SCOPE OF THE PROPOSAL

The Mill Creek Irrigation District has requested authorization for access to their easement at Mill Lake Dam. MCID requests this authorization so they may perform work necessary to correct deficiencies that could potentially negatively affect public safety and the environment, consistent with their responsibilities under dam safety laws and regulations and their existing rights and responsibilities under their easement. This Forest Service proposal is limited to authorizing adequate modes and routes of access necessary for MCID to perform their specified work and any reasonable conditions of access and operations necessary to protect the National Forest (see Appendix B for further descriptions of their proposed work).

It should be noted, in anticipation of these questions, that the Forest Service cannot decide for or direct MCID to permanently breach the Mill Lake Dam. That decision lies solely with MCID, as that decision affects their basic rights under the easements. Similarly, as described earlier, the Forest Service can not deny MCID reasonable access to their facilities as defined by existing law.

This EA tiers off the Final Environmental Impact Statement for the Revised Land and Revised Resource Management Plan for the Bitterroot National Forest and Selway Bitterroot Wilderness Direction and implements the management direction in the Plan.

Based on the analysis in this environmental assessment, the Forest Service will determine whether to prepare and environmental impact statement or a finding of no significant impact.

PUBLIC INVOLVEMENT AND ISSUE IDENTIFICATION

The Forest met with MCID on February 23, 2005 to discuss their plans to repair the dam. MCID officially provided the Forest with notice of the planned work and need for access authorization the following day. The following is a discussion of how the public responded to the proposed action, which the Forest used to help identify and development potential issues.

PUBLIC INVOLVEMENT

A legal notice soliciting comments on the proposed Mill Lake Dam Project was published in the Ravalli Republic on March 21, 2005, marking the beginning of the 30 day comment period pursuant to 36 CFR 215. A similar news release was sent out on March 17. The Ravalli Republic published a news story regarding the project proposal on March 22. The Missoula Independent published a paragraph, regarding the project and suggesting comment, in their April 7-14 issue.

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5. To meet minimum needs for protection and administration of the area as wilderness, only as follows:
   a. An essential activity is impossible to accomplish by non-motorized means because of such factors as time or season limitations, safety, or other material restrictions.

We also mailed a letter soliciting comment on the proposed action to 143 people potentially interested or affected by the proposal. The Mill Lake Dam Project was placed on the April 1, 2005 edition of the Bitterroot NEPA quarterly.

Additional information concerning this project and similar and more extensive dam repair projects was made available on request and through the Forest's internet site. The information included previous environmental assessments and effects analyses as well as subsequent project monitoring results of these projects.

Ten responses were received as the result of the public involvement efforts during the thirty-day scoping period. Three other responses were received after the comment period.

All comments were evaluated and considered, and substantive comments relevant to environmental concerns were incorporated or addressed through project design or mitigation or otherwise in this environmental assessment. Other comments are more appropriately addressed in the decision and other supporting documentation.

The Forest Service identified 3 key topics or issue themes raised during scoping and the 30 day comment period. Two of these issues are elements or extensions of the purpose and need which concern "Dam and Public Safety" and questions, concerns, and support surrounding adequate "Access". The remaining environmental issue concerned potential for adverse effects on "Wilderness Character."

The Forest Service found no significant issues or significant unresolved conflicts that warranted detailed consideration of additional alternatives (also see "Other Alternatives Not Given Detailed Study" later in this document).

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This section describes the proposed action and alternatives. This section also discusses mitigation measures proposed to lessen the project's impacts.

ALTERNATIVE 1-NO ACTION

The No Action alternative is required by the National Environmental Protection Act (NEPA) and will serve as a baseline condition with which to compare other alternatives.

Under this alternative, the Mill Creek Irrigation District would not be authorized helicopter access for the purpose of repairing their facilities. No additional terms or conditions would be placed on their use of this easement. Routine maintenance would continue under the existing easement. This alternative would result in Mill Lake Dam remaining in its present condition, which is not acceptable in regards to the deteriorated condition of the outlet works pipe. The corroded pipe would continue to deteriorate and potentially collapse or cause a piping failure, which would threaten downstream forest resources and public safety.

ALTERNATIVE 2-PROPOSED ACTION

This alternative was developed to address the purpose and need for action.

This alternative was developed to authorize adequate access to Mill Lake Dam to perform the repairs on the dam while limiting effects to wilderness and other resources.

The Bitterroot National Forest proposes to authorize Mill Creek Irrigation District helicopter access to repair their facilities at Mill Lake Dam. The Forest Service would authorize sufficient helicopter access to allow for the work to be done safely and effectively during the 2005 field season. The remaining access, including access for most camp supplies and personnel, would be via stock or foot travel on Trail 364.

In addition, to protect national forest values and resources, the terms, conditions, and mitigation measures specified below would be required during access and work periods authorized under this alternative.

MITIGATION MEASURES, TERMS AND CONDITIONS, MONITORING REQUIREMENTS AND PERMITS REQUIRED FOR THE PROPOSED ACTION

Mitigation measures are those controls or guidelines that reduce or eliminate adverse effects of management activities. Monitoring is the gathering of information and observation of management activities to provide a basis for confirming that work is accomplished as designed and that mitigation measures are effective.

In addition to Forest Service policy and Forest Plan requirements, the interdisciplinary team identified project-specific mitigation measures and other plans and specifications that would be required. The environmental impacts of the proposed action discussion are based on implementation of the listed mitigation measures. Terms and conditions describe mitigation and monitoring items that will be required of MCID.

The terms and conditions and mitigation measures required for the proposed action alternative are displayed on the following Tables 1 and 2.

The following items are MCID's Responsibility:

Table 1 Terms and Conditions (MCID)

Measure
Dam Safety
1. Plans and specifications will be reviewed in accordance with federal laws and Forest Service standards and criteria for high hazard dams.
2. The dam owners are responsible to provide their own radio or telephone communications.
3. During the construction period, MCID and their engineering representative will have an emergency response plan in place to respond to incidents, such as flooding from a major storm event.
Wilderness Resource, Recreation and Wildlife
4. Airlift flights in the valley will be routed to minimize noise near residences. Where feasible and safe to do so, helicopters will avoid flying over mountain goats. When possible helicopters will avoid flying directly over trails. Helicopter flights during the peregrine nesting season should stay as far south in the canyon as is safely possible to limit disturbance.
5. All solid wastes/refuse will be properly stored.
6. All solid wastes will be removed from National Forest lands, except for burnable kitchen wastes.
7. Latrines will be located at least 200' from water and filled in after completion of project.
8. Latrines will be used for human wastes and kitchen wastewater.
9. All fuel shall be stored in an approved spill containment structure that shall be of sufficient capacity to contain all the fuel stored in the structure. The basic containment structure shall include an HDPE-lined basin and berm to contain spills or leaks. Fuel will be stored more than 100 feet from the surface water. All hazardous material will be removed from the site by the end of the operating season. A hazardous spill kit will be on site.
10. Staging areas, fuel storage and containment area, and camping site for Mill Lake Dam will be identified by MCID prior to initiation of project.
11. Schedule the use of helicopters and other motorized equipment to weekdays whenever possible.
12. Post signs at trailhead, by mid-summer to alert hunters or other potentially affected users.
13. Work with the Forest Service to close the trails in the area (Mill Creek Trail #364, Hauf Lake Trail #309, Sears Lake Trail #312 and Fred Burr Trail #38) when the helicopter is flying loads to the dam site for visitor safety. The area directly around the dam site will be closed the entire duration of the project. Camping and visiting Mill Lake will still be allowed. Public notice of closures will be done by MCID.

Measure
Water and Fisheries
14. If possible, all work will be accomplished outside of the standing water. This is to be accomplished by the use of coffer dams around the work area on Mill Lake dam. Pumps will be used to control seepage through cofferdams. Seepage will be pumped into the reservoir so sediments settle**.**
15. If water needs to be pumped over the dam during construction, to maintain coffer dams or for other reasons, the pumped water should flow into sites that would not erode.
16. Disturbed areas, including soil borrow areas, as much as is practical, shall be confined to within the high water mark of the existing lake.
Heritage Resource
17. If previously unknown sites are discovered during implementation, project activities in the vicinity of the site must be halted and the Forest's Heritage Program Manager notified.
Revegetation and Reclamation
18. All equipment and supplies should be inspected and cleaned of weed-seed prior to entering the wilderness It will be essential to use weed-seed free feed for stock while at the dam site and for a few days prior to entering the wilderness in case stock ingest weed seed.
Air Quality
19. Dust control for exposed soil areas at the project site and at the sling load drop site could be abated with water as needed.
Permits and Plans
20. MCID will provide plans and specifications for the work to be done at the dam, to the Forest Service prior to work commencing on the dam, for review in accordance with Forest Service dam safety requirements.
21. MCID would be responsible for obtaining the required state or federal permits. This would include: State of Montana, Department of Natural Resources 310 permit and Army Corps of Engineers 404 permit. A 318 authorization may be required from the Department of Environmental Quality
22. Air Operations, Safety, Camp Management, Materials Handling and Spill Plan, Sediment Monitoring and Communications will be required as a condition for the construction work and will be developed by MCID prior to construction and approved by the Forest Service.
23. A contingency plan and response guide for spill emergencies, including onsite and during transport, shall be submitted and approved by the Forest Service prior to onsite fuel storage.

The following items are Forest Service (FS) Responsibility:

Table 2 Mitigation Measures (FS)

Measure
24. A Forest Service wilderness ranger will discuss resource protection standards with workers.
25. Wilderness visitor safety will be protected by temporary closures during work and helicopter operations.
26. Where cultural resources or human remains are encountered during project implementation, the Forest has the authority to modify or halt project activities.
27. The Forest Service, prior to commencement of work, will approve all specifications and plans prepared by MCID.
28. The Forest Service engineer is responsible to approve any work from a technical standpoint and assure that the work meets dam safety laws and regulations.
29. Issue closure order to close the area/trails to the public when helicopters are flying loads to the dam site and at the dam site during the duration of the project.

ENVIRONMENTAL MONITORING

Monitoring is the gathering of information and observation of management activities to provide a basis for periodic evaluation of Forest Plan goals and objectives and includes administration of this project. The purpose is to determine how well objectives have been met and how closely management standards and mitigation measures have been applied.

Monitoring and Inspection that is MCID's Responsibility:

MCID will provide a qualified engineer for site monitoring and quality control of work.

MCID will develop and implement a sediment monitoring plan and an erosion control plan, in conjunction with the terms and conditions on pages 8-9, and the 310 and 404 permits to ensure that environmental protection and mitigation measures are effective.

Follow-up inspections of the dam after the first filling of water will be required in order to provide monitoring of the effectiveness of the repair work for safety and engineering standards.

Monitoring that is Forest Service Responsibility:

Monitoring specific to All Alternatives

A Forest Service engineer will periodically monitor the work performed at the dams. On-site routine monitoring by USFS engineering personnel will ensure engineering standards are being met.

A Forest Service wilderness ranger will provide additional on-site monitoring during project work to ensure wilderness and resource protection standards are met at dam sites and within the access corridor. The wilderness ranger will provide feedback to ensure access and project work meet mitigation and protection standards.

OTHER ALTERNATIVES NOT GIVEN DETAILED STUDY

Mill Lake Irrigation District investigated a number of alternative repair and access scenarios prior to submitting their final repair plans and request for access to the Forest (Project File (PF) G-11, PF B-13). In the course of evaluating MCID's request and prior to scoping, the Forest explored additional access scenarios in the draft minimum requirements made available at time of scoping (PF H-1). These concepts were evaluated and helped lead to the design of the proposed action. Public comments on the proposal subsequently included a number of additional alternative repair/access scenario suggestions (PF B-6 and B-7).

In all, these scenarios ranged from consideration of abandonment and breach of the dam to consideration of whether the site could be accessed and the work accomplished solely through non-mechanized means to other scenarios which, if viable, might have reduced helicopter flights by as little as one trip. Six of these scenarios are described in further detail in Appendix C and further considerations are provided in Appendix B, D, E, and F.

In all cases, alternatives to the proposed action would have necessitated alterations to MCID's planned engineering designs, materials, and/or methods. In most cases these changes would simply not meet state of practice engineering techniques for design and construction of earthen dams such as this. Others, upon further evaluation, provided little or no additional advantage for wilderness protection and/or added additional environmental or safety risks or otherwise were not deemed consistent with the purpose and need for this proposal.

EXISTING CONDITION AND ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES

This section provides an analysis of the key environmental impacts of the alternatives as described in the specialist reports prepared for this project. It provides the necessary information to determine whether or not to prepare an Environmental Impact Statement. The analysis and conclusions about the potential effects are synopsized and cited below. Additional information is contained in the specialists' reports, which are available in the Project File, located at the Stevensville Ranger District Office in Stevensville, Montana.

Generally, the affected area for this proposed project is within the Mill Creek drainage. However, the analysis area for the project may vary by resource, and changes to the analysis area will be noted in the resource specialist report.

Effects of similar and more extensive past wilderness dam repairs (Canyon and Wyant Lake Dams, Tin Cup Lake Dam and Bass Lake Dam) can be obtained from the Bitterroot National Forest website which can be viewed at http://www.fs.fed.us/r1/bitterroot/planning/tincup.htm.

Key Topics

Dam Safety

Affected Environment

Dams can have serious affects on people, property and the environment, which extend far beyond the property of the dam owner. Dams classified as high hazard have more stringent requirements for design and construction. Mill Lake Dam is classified as a high hazard dam based on the potential consequences of failure. The high hazard designation means that the failure of the dam would cause destruction and possible loss of life downstream. The hazard designation does not signify the condition of the dam. If Mill Lake Dam were to fail, several residences located downstream would be endangered. This situation results in the potential loss of life or excessive economic loss, which is the basis for the high hazard classification. New homes have been and continue to be constructed within the inundation area downstream of Mill Lake Dam.

Refer to Appendix B for a detailed description of the existing condition of Mill Lake Dam and Mill Creek Irrigation Districts proposed work to be done.

The desired condition from a dam safety perspective is a safe, durable dam that is operated, maintained and repaired in accordance with current federal dam safety laws and standards. In addition to providing a safe and reliable source for irrigation water to downstream users, the dam provides other public benefits. Benefits include the recharge

of critical groundwater aquifers from irrigation water, improving riparian areas for wildlife habitat during late summer when discharges from the dam storage augments low flows in Mill Creek, and securing a water source for future development needs in the Hamilton area.

Effects on public health and safety

Alternative 1 does not adequately protect public health and safety and downstream residences. If the repairs are not completed in a timely manner, the corroded corrugated metal pipe will continue deteriorate. This could lead to the collapse of the outlet works and a potential piping failure. Piping around the outlet works is one of the leading causes of failure for earthfill dams. In the case of Mill Lake Dam, damages would likely include environmental damage on both public and private property, loss of water supply for irrigation purposes, flood damage to private homes and buildings, possible damage to county roads and bridges, and the potential for loss of life. If the dam failed or no longer functioned, existing secondary benefits from the dam would also be lost.

Alternative 2 corrects the deficiency of the corroded and deteriorated outlet pipe by installing a new pipe and headgate and grouting between the new and old pipe. This alternative protects public health and safety by correcting the unsafe condition of the dam. In addition, measures to limit the use of the Mill Creek Trail during helicopter activity in Alternative 2 would ensure safety of the public.

Refer to pages 59 and Appendix A for Consistency and Regulatory framework for dam safety

Access

Affected Environment

Mill Lake Dam is located approximately 10.5 miles inside the Selway-Bitterroot Wilderness boundary at the head of Mill Creek. Public access to Mill Lake is by Trail # 364 which originates on Road #1328 at a developed trailhead. Distance to the lake from the trailhead is approximately 13 miles. See page 17 for details of trail condition.
See pages 3-4 for a discussion of legal rights of MCID to access Mill Lake dam.

Effects on Access

Alternative 1 does not meet the purpose and need to access Mill Lake dam and the legal requirements to authorize adequate access. This alternative is beyond the Forest Service legal discretion, because the agency cannot deny the MCID reasonable access for the valid use of their easement. (see page 3)

In alternative 2, access would be authorized to MCID for use of a helicopter to repair the facility at Mill Lake Dam. Some equipment, camp supplies, and personnel would be transported by foot or stock. This would meet the need to access the dams and legal

requirements to authorize adequate access. Closures along the trails and at the dam site would affect some users access to the area during times the helicopters were delivering equipment or materials to Mill Lake Dam for safety precautions.

Refer to Appendix D, and PF G-4, G-5 and G-6, for Consistency and Regulatory framework for access.

Wilderness Character

Wilderness Character including Wilderness Resource and Legal Settings

Wilderness, Trails and Recreation

Wilderness, Trails and Recreation Existing Condition

Mill Lake Dam is located approximately 10.5 miles inside the Selway-Bitterroot Wilderness boundary at the head of Mill Creek. Public access to Mill Lake is by Mill Creek Trail # 364. Distance to the lake from the trailhead is approximately 13 miles. The area of analysis for the proposed project is the Mill Creek drainage from its headwaters to the wilderness boundary, (approximately 10.5 miles) and also from the wilderness boundary to the Mill Creek trailhead, (approximately 2.5 miles) because the potential direct and indirect effects of the proposal are generally well contained within this watershed boundary. Some discussions of the larger wilderness setting are included to provide context to these effects. The analysis area includes Trail #364 (Mill Creek Trail), Trail 309 (Hauf Lake Trail), Trail #312 (Sears Lake Trail) and Trail #38 (Fred Burr Trail). The Mill Creek drainage area in wilderness is approximately 11,282 acres in size. See Map #2

Wilderness

The Selway-Bitterroot Wilderness lies within the Bitterroot, Nez Perce, Clearwater and Lolo National Forests. General management direction for the Selway Bitterroot Wilderness is contained in the SBW General Management Direction (Forest Plan Amendment #7, 1992). (PF G-10). This document is included as an appendix to each of the four forest plans. The Selway-Bitterroot Wilderness, third largest wilderness in the lower 48 states, totals 1.3 million acres and the Bitterroot National Forest contains 508,000 acres of this total.

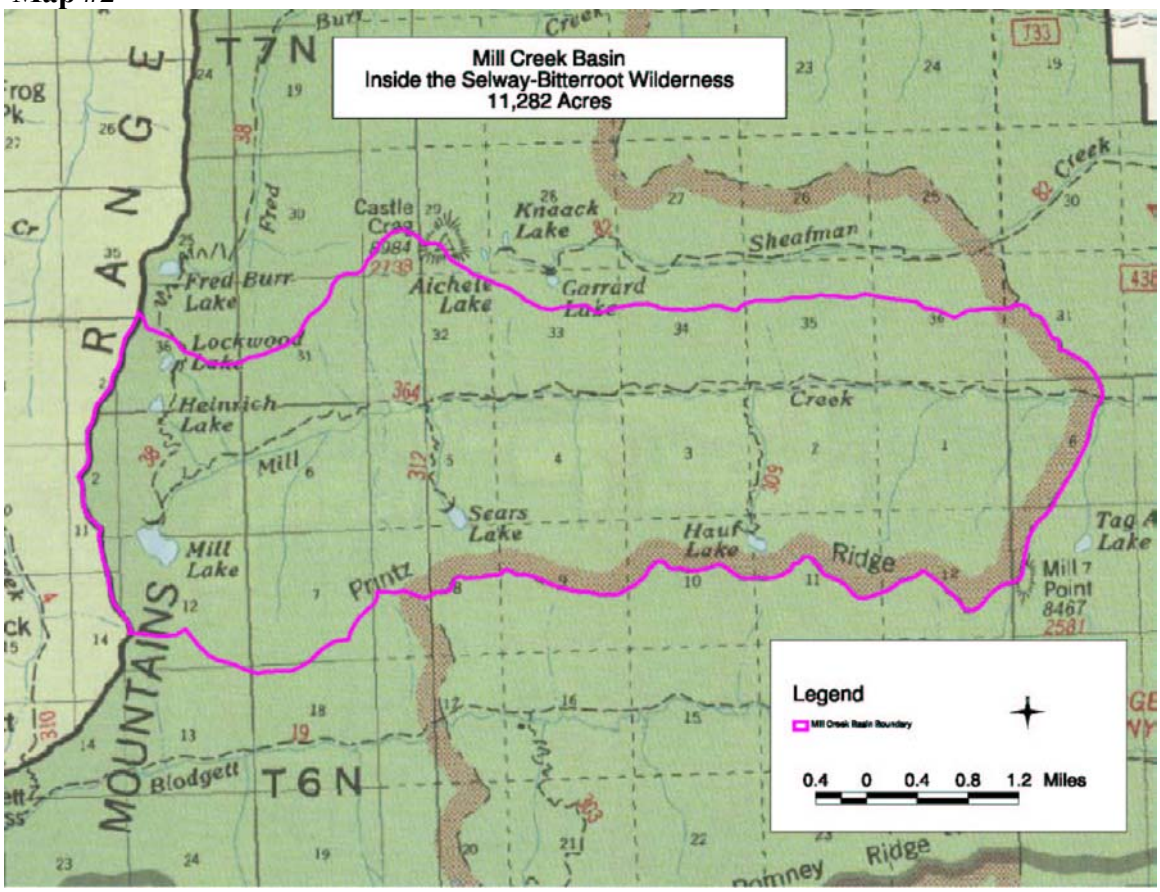
A unique characteristic of this wilderness is the presence of sixteen irrigation dams all established before the 1964 Wilderness Act and some established before designation of the Bitterroot National Forest.

General wilderness characteristics of this drainage are summarized in six categories:

1. Natural integrity refers to the extent to which long-term processes are intact and operating, and is measured by the presence and magnitude of human induced change. The impacts of human activity are generally light, with the exception of the Mill Lake Dam, Trail #364 and campsites.

Mill Creek Basin inside the Selway-Bitterroot Wilderness Map

Map #2



2. Apparent naturalness is indicated by how the environment looks to most people using the area. Human activities are primarily confined to the narrow trail corridor and the area immediately adjacent to the dam and reservoir. The remainder of the area is topographically extreme and discourages human activity. Humans have had a minor impact in these areas through the suppression of fires.

3. Remoteness is a perceived condition of being secluded, inaccessible and out of the way. The presence of humans is apparent in the trail corridor and immediate lake area. Any remoteness is experienced due to topographic relief and vegetation screening and increases as one gets further up Mill Creek trail #364.

4. Solitude is a personal, subjective value defined as isolation from the sight, sound and presence of others and the developments of humans. The feeling of solitude in

its purest sense is not available within the trail corridor or lake basin. Encounters are more frequent within the first 3 miles of Mill Creek Trail #364 and decrease as one gets closer to the lake.

5. Special features are those unique geological, ecological, cultural or scenic features that may be located in Wilderness. Notable features include spectacular scenery, air quality, wildlife and opportunities for wilderness related activities. Some people view the dams within the wilderness as important cultural artifacts. Reminders of our early day settlers to the Bitterroot Valley and how these helped carve out a lifestyle.

6. Manageability and Boundaries – The Selway Bitterroot Wilderness lies within the Nez Perce, Clearwater, Bitterroot and Lolo National Forests. General Management direction for the SBW is contained in the SBW General Management Direction prepared by the four forests in 1992. This document was included as an appendix into each Forest Plan and wilderness management standards in the individual plans were based on it.

The wilderness is divided into four Opportunity Classes (OC) developed to allow for and provide a range of wilderness experiences, from the most pristine Opportunity Class 1 to most heavily used Opportunity Class 4. By allocating different opportunity classes, overall degradation of the wilderness resource can be prevented, while simultaneously establishing realistic objectives for those areas that receive more use, and consequently more impacts. However, each area will be managed to meet the limits of acceptable change prescribed for its designated opportunity class. The opportunity class descriptions provide managers with a hypothetical framework for managing towards the desired further conditions for the wilderness and by outlining the desired resource, social and managerial settings. These descriptions are described in narrative form in the SBW General Management Direction on pages A-3 to A-6 and B-2 as well as summarized on Tables A-1 (page A-2), and A-2 (page A-7) (PF G-10).

The affected environment is in Opportunity Class 2. Although the natural environment is generally unmodified, there are many locations substantially affected by the actions of users. Environmental impacts are restricted to minor loss of vegetation where camping occurs and along most travel routes. Impacts in a few areas persist from year to year, and are noticeable to a few visitors. Mill Lake is located in a square mile classified as a Problem Area, defined as “locations within the Selway Bitterroot Wilderness where conditions do not meet one or more specified standards”. Impacts are evaluated using standardized procedures that measure various impacts, including vegetation loss, soil disturbance, damage to trees, development, cleanliness, etc. Most of these conditions have existed since the standards were put in place in 1992. This area has three campsites (two heavy and one moderate). Standards limit the number of campsites to 2 (and impacts to one light, one moderate and zero heavy or extreme). Standards for maximum # of other parties encountered each day is an 80% chance of meeting no other parties. The standard for maximum # of other parties camped within sight or sound is an 80% chance

of seeing or hearing no other parties. The area is high elevation and the fragile vegetation is vulnerable to stock damage.

Recreation

The Recreation Opportunity Spectrum (ROS) is a land management tool used to classify lands based on the different recreation settings they provide. The system considers several indicators when classifying an area of land including remoteness, access, naturalness, facilities and site management, social encounters, visitor impacts, and visitor management. The setting, activities, and opportunities for experiences have been arranged along a continuum divided into six classes: primitive, semi-primitive (motorized and non-motorized), roaded natural, rural and urban (USDA Forest Service ROS users Guide). The Mill Creek drainage portion outside wilderness is classified semi-primitive (motorized).

Mill Creek's proximity to Hamilton and Corvallis make it a popular day and overnight use area during the snow-free season. Visitors have diverse recreational opportunities, including hiking, horseback riding, hunting, fishing, rock climbing and photography.

Trails

The mainline trail traversing this area is the Mill Creek Trail #364 which originates on Road # 1328 at a developed trailhead. Approximately 2.5 miles is outside wilderness from the trailhead to the wilderness boundary, and approximately 10.5 miles traverse the drainage bottom to the Mill Lake reservoir. Visitor use on Mill Creek Trail #364 is primarily hiking, most often as day use up to Mill Creek Falls approximately 3 miles in. Horseback use is also popular riding up to Mill Lake and out in a day, a 26 mile round trip. Mill Creek Trail #364 is maintained annually to accommodate heavy foot and stock traffic during the summer use season. The trail has always been considered a mainline route, accessing a high hazard dam, as well as access to trails to two other dams on Hauf and Sears Lake. The area was burned over in fires of 2000, approximately 6 miles of it was affected from the trailhead to where Sears Lake Trail #312 junctions with Mill Creek Trail #364. Fred Burr Trail #38 junctions with Mill Creek Trail #364 just before the reservoir accessing Heinrich, Lockwood and Fred Burr Lakes. Extensive reconstruction and construction work on Mill Creek Trail #364 over the past two years has been done with additional work planned for 2005. The trailhead has hitch rails and a loading ramp with adequate parking for stock trailers.

Wilderness Environmental Consequences

Introduction

This section will discuss and disclose the environmental effects of this project on the wilderness, trails, and recreation resources of the Mill Creek drainage from its headwaters to the wilderness boundary, (approximately 10.5 miles) and also from the wilderness boundary to the Mill Creek trailhead, (approximately 2.5 miles). This area in wilderness is approximately 11, 282 acres. See Map # 2.

Effects are measured using parameters determined through public scoping and by using criteria in the Forest Plan (1987), and in the Selway Bitterroot Wilderness General Forest Plan Management Direction (Amendment #7). These documents disclose standards and management direction for the Selway Bitterroot Wilderness, trails and recreation.

The environmental consequences of each alternative will be discussed and evaluated within the context of three settings: the wilderness resource setting (natural integrity, apparent naturalness, remoteness, solitude and specials features); the trails and general recreation setting; and the wilderness regulatory setting (applicable laws, regulations and policies that effect activities related to wilderness and worker safety).

Effects Common to All Alternatives

Direct Effects

Wilderness Resource Setting

In all alternatives, the presence of Mill Lake Dam affects the wilderness resource. The natural integrity of water flows is restricted by the storage and release of water from the reservoirs. Apparent naturalness and visitor's need of remoteness are affected by visual evidence of human structure. These effects are considered acceptable within the parameters of the Wilderness Act and subsequent legislation because Congress recognized these irrigation facilities existed at the time of the Wilderness Act and as required by both the Wilderness Act and ANILCA access to valid occupancies such as these easements held by the MCID is required. (See PF G-4, G-5 and G-6)

Alternative 1

Direct Effects

Wilderness Resource Setting

See effects common to all alternatives. Routine maintenance would continue under the existing easement and in compliance with dam safety requirements. These effects are considered acceptable within the parameters of the Wilderness Act and subsequent legislation. These effects are considered acceptable within the parameters of the Wilderness Act and subsequent legislation because Congress recognized these irrigation facilities existed at the time of the Wilderness Act and as required by both the Wilderness Act and ANILCA access to valid occupancies such as these easements held by the MCID is required. (See PF G-4, G-5, G-6)

Trails and General Recreation Setting

There would be no additional use on the trail and no additional use at the parking area beyond the normal seasonal use by recreationists and MCID members traveling up the trail to conduct their annual maintenance work. There would be no area closures.

Wilderness Regulatory Setting

There would be no use of mechanized transport or motorized equipment. There would be no increase of use at campsites and therefore no change in the lake basin's problem area status. There would be no effects to worker safety.

This alternative is beyond the Forest Service legal discretion, because the agency cannot deny the MCID reasonable access for the valid use of their easement. (see pages 3 to 4 and Appendix D).

Indirect Effects

Wilderness Resource Setting

The wilderness resource would be affected if the dam fails as a result of not being made safe through this repair work. If the deficiency of the outlet pipe is not repaired, there is an increased risk of dam failure caused by piping associated with the corroded corrugated metal pipe. This could result in severe soil movement, drainage scouring and vegetation damage. This soil movement has the potential for effects to natural integrity (changing stream channels and opening areas to noxious weeds), apparent naturalness (as a result of trail or watershed repairs) and special features.

Trails and General Recreation Setting

The dam could potentially fail sometime in the future as a result of not repairing the outlet works. This would result in severe erosion of Mill Creek Trail #364 in numerous locations close to the creek. This trail damage would temporarily limit visitor access and be costly to repair.

Wilderness Regulatory Setting

Repeated heavy maintenance requests to provide temporary fixes to dams safety problems would take place and there would be frequent requests to use mechanized transport or motorized equipment. If the dam fails as a result of not being made safe, worker and public safety would be compromised.

Cumulative Effects

Wilderness Resource, Trails and General Recreation, Wilderness Regulatory Settings

Because of the ephemeral and geographically limited nature of this proposal's effects on the Wilderness setting, they don't appear to be cumulative (overlapping in both time and space) with other past, present or reasonably foreseeable actions. But, there may be both concurrent, similar activities (Tin Cup dam, Canyon Dam, ongoing trail and dam maintenance, etc.) and reasonably foreseeable activities (trail and dam maintenance) in the broader Wilderness area. Additional future repairs on Mill Lake Dam have also been discussed, but we have not received a proposal yet and the nature and timing of the repairs are still speculative.

The Selway Bitterroot Wilderness includes approximately 1,340,360 acres. The Mill Creek drainage is approximately 11,282 acres. Thus, the affected environment for the Mill Lake Dam project is approximately 0.84% of the entire Selway Bitterroot Wilderness. Estimated length of project is 3-4 weeks with mechanized transport only 4-5 days of that total time. While the project is ongoing users choices of destinations may be limited for short periods but Wilderness visitors would continue to have the opportunity to visit another portion of the remaining 1,329,077 acres within the SBW to obtain the wilderness experience they have come to expect.

Alternative 2

Direct/Indirect Effects

Wilderness Resource Setting

This alternative would affect apparent naturalness, remoteness, and solitude. Apparent naturalness is indicated by how the environment looks to most people using the area. Repair and maintenance activities at the dam site will have short- term effects on sight and sound. Apparent naturalness would be directly affected by the sight and sound of helicopters, ground transport of supplies and personnel, and those activities associated with the actual repair of the dam. Effects of helicopter noise and visibility would occur during the transport phase of the project (about one day to mobilize equipment and supplies in excess of 200 lbs, one to two days to transport the grout and one day to demobilize.

The largest negative effect would result from the noise and sights of the activities directly associated with repair of the dam. Repair and maintenance activities at the dam site will have short-term effects on sight and sound perception of visitors. Remoteness is a perceived condition of being secluded, inaccessible, and out of the way. Sights and sounds of the repair work will be apparent near the dam and reservoir, affecting the feeling of remoteness for people actually in the drainage at the time of activities.

Solitude is a personal, subjective value defined as an isolation from the sights, sounds, and presence of others and the developments of man. The presence of workers and equipment, and the resulting noise will affect the feeling of solitude of the area during the repair work.

Mitigations for signing, personal contacts by Wilderness rangers and pre-announcing when various activities will be taking place will allow most potential users the opportunity for solitude and remoteness in the remaining 1.3 million acres of the SBW or another Wilderness area close by during these few weeks while the project is ongoing.

Trails and General Recreation Setting

Mill Creek Trail #364 would be used by pack stock to supply camp, haul in supplies, personnel, equipment and materials. This use should be infrequent (an estimated 4 round trips) and would be similar to what recreationists would normally encounter along the trail. Effects to the Mill Lake worker campsite would be minimal. Recreational restrictions in the vicinity of work at Mill Lake would depend on the location and timing of work and on safety considerations. The need for area closures during the time helicopters are being used for transport would affect visitor's access along the trail and at Mill Lake Dam. Areas not directly involved in work projects would remain open for use. Trail use information would be provided, in part, by using a wilderness ranger to monitor progress and to inform users. Public notices posted at the trailhead and in the local newspapers would also be used.

Cumulative Effects

Wilderness Resource Trails and General Recreation, Wilderness Regulatory Settings

Because of the ephemeral and geographically limited nature of this proposal's effects on the Wilderness setting, they don't appear to be cumulative (overlapping in both time and space) with other past, present or reasonably foreseeable actions. But, there may be both concurrent, similar activities (Tin Cup dam, Canyon Dam, ongoing trail and dam maintenance, etc.) and reasonably foreseeable activities (trail and dam maintenance) in the broader Wilderness area. Additional future repairs on Mill Lake Dam have also been discussed, but we have not received a proposal yet and the nature and timing of the repairs are still speculative.

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Refer to pages 59 to 61 for Consistency and Regulatory framework for Wilderness Resources.

Refer to Appendix D for references.

Other Resources

Water Resources, Wetlands/Floodplains

Physical Description and Existing Condition
Mill Lake Reservoir is located on National Forest Lands in the Bitterroot Mountains almost due West of Hamilton, Montana. It is located in the upper reaches of the Mill Creek drainage, at 6,548 feet elevation. Water stored in the reservoir is used mainly for irrigation on private lands. Capacity of the reservoir is approximately 780 acre-feet. Contributing area above the reservoir is estimated at 550 acres.

Mill Creek below the Selway-Bitterroot Wilderness Area boundary is listed on the 2002 MTDEQ 303(d) list as having impaired water quality. The table below summarizes the listing:

Mill Creek CWA 303(d) listing:

Location and distance listed as impaired	Partially supported beneficial uses	Probable causes	Probable sources	Assessment methods and information surveys
Selway-Bitterroot Wilderness Boundary to mouth (Bitterroot River), 8 miles	Cold water fishery (trout); Primary contact (recreation)	Flow alteration; other habitat alterations; thermal modifications	Agriculture; grazing related sources; construction; highway/road/bridge construction; habitat modification (other than hydromodification); removal of riparian vegetation	Fish surveys

To paraphrase the listing, two beneficial uses are considered only partially supported due to degraded channel or water quality conditions. The remaining beneficial uses pertinent to B-1 designated waters were not assessed with the survey process.

In 2004, a restoration project on private land built a reach of channel using heavy equipment. Goals included restoration of a historic meandering-type channel with natural characteristics and improved fish habitat. This section is likely still experiencing minor channel adjustments along with growth of stabilizing vegetation, and should be considered a sediment source during high flows.

Wetlands

Jurisdictional wetlands within the Mill Creek watershed are somewhat limited. Most are linear features along the margins of the stream channel. Flood-prone areas along the stream, seeps, and springs are the main locations for riparian species within the canyon. Some water-loving or wetland species have utilized habitats made available by the construction and operation of the reservoirs. These areas are generally limited to seepage areas along the dam front. It can also be argued that use of the water impounded in these reservoirs creates some downstream riparian areas through agricultural irrigation.

Wilderness designation has maintained wetlands on the National Forest portion of the watershed in very good to excellent condition. Off-Forest, wetland condition is difficult to summarize. This is due to wetland losses from irrigation diversions, channelization, and hardening of stream banks, contrasting with increases in wetlands from flood irrigation.

Water Resources Summary

Water resource and watershed conditions in the Bitterroot National Forest portion of the Mill Creek watershed are considered very good. The designated wilderness status of the upper watershed has protected water resources from most human impacts. Minor effects from trail maintenance and use have not degraded water quality or watershed function. Mill Lake Dam does affect stream flows for an undetermined distance downstream of its location, but the small percentage of watershed area it controls and the timing of releases minimize downstream impacts. On the negative side, irrigation diversions and varied land uses in the private land portion of the watershed has detrimentally impacted water quality and fish habitat.

Water Resources -Desired Condition

The desired condition for water resources is stated in the Regulatory Framework section in pages 61 to 64. The implied goal is to meet all regulatory standards for water quality pertinent to the Montana DEQ B-1 classification. Conditions in the Mill Creek watershed on Forest Service lands currently meet all pertinent regulatory direction. Water resources are currently meeting the goals stated in the 1987 Bitterroot National Forest Plan (listed above). Water quality within the Selway-Bitterroot Wilderness Area presently supports all State-assigned beneficial uses, but cold-water fishery and primary contact recreation are only partially supported below irrigation diversions which partially de-water the stream in the summer and fall.

Effects on Water Resources

Consequences of Alternatives

Two alternatives have been developed, based on no-access/access. Alternative 1 is the "No Action" Alternative required by NEPA. Alternative 2 is the Proposed Action, which would grant helicopter access to the MCID. Neither alternative would have significant water resource effects.

Alternative 1 – No Action: This alternative would leave Mill Lake dam in its present condition. No helicopter access would be granted. Direct and indirect construction effects would be limited to normal maintenance for the dam, maintaining the present level of watershed effects.

Discussion with the MCID and engineers suggests that meeting modern dam safety standards with old technology is problematic. Since the MCID has indicated that it wishes to keep the reservoir in operation, this alternative would result in an increased dam safety problem over time. If the reservoir stays in operation without the recommended repairs or is simply abandoned, the risk of a dam or outlet failure would increase, along with the threat to human safety and water resources in the analysis area. Dam failure would likely result in high flows, a possible flash flood, large sediment release from the reservoir, and extensive scouring throughout the canyon. Streamside riparian areas could be severely damaged or eroded away completely.

Alternative 2 – Proposed Action:

Direct and Indirect Effects Common to Alternative 2

No ground disturbance or water resource effects would result from the helicopter transport of equipment and some personnel to the work site. Camp and construction personnel would access the camp or work site by foot or stock. Some trail erosion is expected, but the water resource effects would be minor. The trail to the dam is well established and maintained to Forest Service standards. It is expected to handle the construction traffic with no adverse effects and only minor post-project maintenance.

The only possible direct effect from the proposed action (Alternative 2) would be either a helicopter crash or loss of sling-loaded fuel or other construction materials. This would be minimized through use of standard loading and hauling methods designed to reduce mishaps. The likelihood of a crash or dropped load creating a substantial or long-lasting water resource impact is quite low, even if one of these unfortunate events occurred. This is due to the limited amount of aquatic, wetland, or floodplain sites within the drainage, and the low degree of connectivity between upland sites greater than several hundred feet from a channel or wetland.

Wetlands

Alternative 1 (the No Action Alternative) would not threaten any existing wetlands, unless a dam failure causes channel and streambank scouring. Reservoir operation would stay as it has been and preserve the status quo for wetlands in the analysis area. Risk of flash flood damage to streamside wetlands would gradually increase over time with this alternative.

An indirect effect of granting helicopter access to the site (alternative 2) is the repair work that would be enabled by the improved access. The dam repair work would disturb

small areas around the dams, outlet channels, and trail. With the small area affected by physical disturbance and operational mitigations, a measurable loss of wetlands is unlikely. Wetlands associated with the reservoir water lines, and inlet stream channel would not be altered by the proposed access or associated construction work, as they are subjected to seasonal water level fluctuations on a yearly basis. The proposed management would not threaten other wetlands elsewhere in the watershed due to the distances involved and minor flow and sediment effects.

Floodplains

Narrow and discontinuous flood plains make Upper Mill Creek a typical Bitterroot Mountain Range stream. Geologic processes of uplift and glaciation have acted to limit floodplain formation within the canyons, and therefore floodplain alteration by construction activities is a negligible risk. Operational mitigations and necessary permits act to further limit floodplain impacts at the construction site. Some observable floodplain is present on public lands below the canyon mouth, but the potential for construction work many miles up the canyon to affect floodplain form or use in this location is very low.

The No-Action Alternative creates an increasing risk of potential dam failure and an associated flash flood, which would scour the stream channel and degrade what little flood plain does exist.

Cumulative Effects

Past Effects

The watershed boundary for Mill Creek defines the cumulative impacts analysis area. The upper watershed is within the Selway-Bitterroot Wilderness and has experienced little human disturbance other than dam construction, maintenance and operation. All dams were constructed without modern motorized equipment. The effects of the original construction (mainly sediment from quarry sites and ground disturbance) have likely subsided to the point of non-existence, or were mitigated by storage in the reservoir pools. Reservoir and dam operations since that time have included the filling and draining of the pools, clearing of driftwood and occasional maintenance of the spillways and dam crests. Seasonal draining would change flow and sediment regimes somewhat from those existing before the dam. Flow regimes are discussed in the hydrology Existing Condition section. Dam operations tend to contribute little sediment to the stream due to the rocky nature and low sediment input from the contributing area above the dam. The reservoir also acts as a stilling pond and what sediment is carried into the reservoir is effectively stored in the inlet end of the waterbody. Effects from maintenance and operation have been minimal, as evidenced by site conditions around the dam and good water quality in the creek. This maintenance is expected to continue in the future if Alternative 2 is chosen, with similar limited environmental effects.

Mill Creek below the designated wilderness boundary has been identified as a water quality-limited stream on the MTDEQ 303(d) list, which suggests that the present level of cumulative impacts is limiting beneficial uses. The Forest Service position on this listing is that the stream is unimpaired to the private/Forest Service boundary (a difference of several miles), due to the lack of management activities on the non-Wilderness sections of the watershed as well (please see the Affected Environment report for water resources for more discussion). On private lands below the forest, development and irrigation diversion have created various impacts and the listing may be appropriate for this reach. Mill Creek does not connect with the Bitterroot River the entire year. Housing development, road building, agriculture, channelization, and other rural and suburban activities have combined to degrade stream health below the Forest Service boundary. These activities will continue to provide increase sediment and reduce flow in the creek, although it is difficult to predict the extent of either impact.

The Blodgett Campground fire burned a small portion of the Mill Creek watershed in 2000. This fire and its effects are discussed in the Affected Environment section for water resources. No additional fires have occurred since 2000, although some salvage logging operations were implemented to the north of Mill Creek in 2001 and 2002. These activities are within the 6th level administrative watershed, but are not within the contributing area for Mill Creek. Obliteration of 1.5 miles of road, reseeding, and road reconstruction occurred in the Cow Creek area, to improve watershed conditions. These post-fire activities were reviewed during a MTDEQ best management practices (BMP) assessment in 2004, resulting in an overall good rating for implementation and effectiveness. Only one culvert placement was deemed insufficient, due to lack of seeding in the disturbed fill slope above the culvert outlet and lack of an energy dissipater below the outlet. Otherwise, the BMP practices for the timber sale were deemed adequate or better.

Present Effects

Currently, Forest Service activities that could affect the local water resources in the Mill Creek watershed are minimal. Other than normal maintenance activities, no work is presently planned on trails or the trailhead area. Unauthorized ATV trails are occasionally found in open areas near the USFS/private boundary, but most are on dry ridges and benches and do not significantly effect water quality. Prescribed fire has been used in the vicinity but none have resulted in negative watershed effects. Wilderness activities are limited to camping, hiking, and stock use, none of which has been noticeably degrading stream or watershed health.

Potential Future Effects

Potential future disturbance in the watershed includes further work on the dam, trail maintenance or reconstruction, trailhead improvements, and hazardous fuel reduction projects near the Forest Service boundary. Most of these have the potential of contributing small amounts of sediment to Mill Creek, but none have the potential for major effects either singly or in unison.

Improvements to the dam's berm and spillway may be proposed in the next several years. These would require some disturbance around the site and have the potential to contribute some sediment to Mill Lake and the downstream channel. A similar operation at Canyon Lake Dam in 2004 was successful in preventing any observable downstream impacts, and the potential work at Mill Lake dam has a high likelihood of similar success. Negative effects from this potential future work would be localized, minor, and short-term.

Trail and trailhead management would continue as it has in the past. Occasional trail maintenance would rebuild sections of trail as needed. Drainage would continue to be maintained to minimize erosion and sediment from this source.

Hazardous fuel reduction projects may include manual and mechanical (heavy equipment) vegetation treatments, and prescribed fire. Mechanical treatments are generally excluded from riparian areas, although this may not always be the case. INFISH regulations allow timber harvest within the designated buffer zones as long as achievement of riparian and fish habitat management objectives is maintained or promoted. Prescribed fire may be allowed to burn in riparian areas, but direct lighting is limited by the INFISH regulations. Any impacts from prescribed fire or manual treatments would be minimal and extremely short-term; mechanical treatments have more potential for generating sediment and creating a slightly longer-term (2-3 years) impact. These potential activities would be subject to the appropriate NEPA process and specialist review and therefore are not considered a significant threat to water resources.

Cumulative Effects Summary

Overall, the cumulative effects on the USFS portion of the Mill Creek watershed are insignificant for water resources. Once the stream leaves USFS lands, stream health declines due to a myriad of land-use activities. It is worth noting that several landowners have embarked on a channel restoration project that should have positive stream health and fish habitat effects. Otherwise, the trend from a rural to a suburban community will continue to affect stream health on private lands within the Mill Creek watershed. Foreseeable Forest Service activities in the drainage are minimal and pose no threat to water resources.

Water Resources Summary of Effects

Neither alternative is likely to cause a significant watershed impact. The No-Action alternative (Alternative 1) does not create an imminent threat of dam failure, although a longer-term view of the situation suggests the outlet works and dam could fail during full pool at some time in the future. In Alternative 2, the direct action of granting helicopter access poses little threat to water resources. The associated dam repair work that would be enabled by the potential selection of Alternative 2 (Proposed Action) would also pose little risk to water resources, due to agency permitting, mitigation, small area disturbed, and the nature of the slip-lining process.

Refer to pages 61 to 64 for Consistency and Regulatory framework for water resources.

Refer to Appendix G for references.

Fisheries

Existing Condition

Mill Lake is a high-elevation fish-less reservoir located in the Bitterroot Mountains almost due West of Hamilton, Montana. Water stored in the reservoir is used mainly for irrigation on private lands, which are ten miles downstream. Contributing area above the reservoir is estimated at 550 acres. See the "Water Resources" for more physical characterizations of the drainage (USDA Forest Service 2005a).

Mill Creek is a steep stream consisting of high gradient riffles interspersed with pools formed by large wood accumulations and scour around boulders. In late July and August of 2003, discharge was approximately 65 cubic feet per second (cfs) a mile upstream of the Forest boundary (upstream of the water withdrawal ditches). June discharge was too high and swift to wade and measure safely. The substrate is primarily gravel, cobble, and boulders.

Westslope cutthroat trout have not been observed in Mill Lake or immediately downstream (2001 Lake Survey Notes, Mill Lake Survey 1980, and anecdotal accounts). They have been observed near the wilderness boundary during surveys in the early 1990s. In 2001 Hienrich Lake, which has an outlet that meets Mill Creek 0.7 miles below Mill Lake dam, was stocked with westslope cutthroat trout, and these fish may be able to populate upper Mill Creek with cutthroat trout. Habitat conditions downstream of Mill Lake dam fluctuate drastically in the summer as lake operations and maintenance has varied the flows. This variability may create a relatively inhospitable environment for fish in the upper watershed. Relatively acidic water (pH 4.5) has also been reported (David Jones, pers. comm. 2005), which may influence fish presence in the upper watershed.

Results of preliminary genetic analyses of cutthroat trout (samples came from near the FS-private boundary) were that this population is not genetically pure westslope cutthroat trout (Montana River Information System (MRIS 2000).

Bull trout have been observed eight miles below the Mill Lake dam. The population appears to be small and composed of resident-sized fish. Connectivity to the Bitterroot River and Fred Burr Creek (a tributary to Mill Creek in the lower watershed) is restricted by water withdrawals.

Introduced species appear to impact the native species in this stream. Rainbow trout (Oncorhynchus mykiss) and cutthroat-rainbow hybrids have been reported as being "common" in the same locations where the cutthroat trout exist. Brook trout (Salvelinus fontinalis) are abundant in lower Mill Creek, and overlap with the habitat occupied by

bull trout. Brown trout (Salmo trutta) have been observed in lower Mill Creek, downstream of the area where bull trout have been observed. Elevated water temperatures and dewatering have made much of the stream downstream of the Bitterroot National Forest (BNF) seasonally uninhabitable for bull trout and increased the amount of habitat occupied by non-native brook trout. Brook and brown trout have a competitive advantage in streams with warmer temperatures.

A strategy was developed in 1995 to protect habitat and populations of fish in the inland northwestern United States. It is commonly referred to as INFISH and was amended to the Bitterroot National Forest's Forest Plan. Four interim INFISH riparian management objectives (RMOs) apply to BNF reaches of Mill Creek: (1) pool frequency; (2) large woody debris (LWD) frequency; (3) mean-maximum water temperature; and (4) mean wetted width-depth ratio. As a result of the Wilderness character of the upper half of the watershed and the inaccessibility of the other BNF portions of Mill Canyon, RMOs are near their natural background levels in the BNF. Maximum high temperatures for seven days upstream of the 2000 burn in 2001 were 15.0^{o}C; downstream of the burn they were 16.5^{o}C. Re-growth of the understory since 2001 has likely led to cooler temperatures in the burned area.

The Forest Plan defined a fish population viability concern as a decline in aquatic habitat quality or fish population for more than one year (Item 21), and a 10 percent difference from projected cutthroat trout yield (Item 41). Research and monitoring of fish populations over the past 13 years on the Forest has shown the Forest Plan viability definition stated above is too narrow given the natural variation that occurs in fish populations. We have learned that the only way to define the upper and lower bounds of the natural variation in fish populations is through numerous years of population monitoring.

The key findings from the fish population monitoring that has occurred across the Forest since 1990 are:

- Westslope cutthroat trout populations appear to be stable across the Forest. Populations do fluctuate naturally over time, but monitoring data indicates a stable trend forest-wide.
- Westslope cutthroat trout are easily the most abundant fish species on the Forest. They are present in nearly every fish-bearing stream, and likely occupy > 90% of their historic habitat on the Forest.
- Westslope cutthroat trout occur at reduced numbers in the Bitterroot River and the private reaches of tributaries on the valley floor. However, the population of migratory westslope cutthroat trout in the river has been increasing over the past 10 years.
- The overall viability of westslope cutthroat trout in the Bitterroot River basin is considered to be "depressed", primarily because of the habitat fragmentation that occurs on private land between the Bitterroot River and its tributaries, and the reduced numbers of migratory adult fish in the river. A key problem is the lack of year-round connectivity between the Bitterroot River and its spawning and rearing tributaries.

- Since 1990, bull trout populations appear to be stable in the majority of Forest streams. Bull trout populations also fluctuate naturally, but again, the monitoring data indicates a stable trend forest-wide.
- One stream where the monitoring data indicates that bull trout have declined or possibly disappeared is upper Rye Creek (i.e. the Rye Creek 12.4 monitoring reach). In the Skalkaho Creek drainage, bull trout population numbers have remained particularly strong.
- Connectivity between the rivers and spawning and rearing tributaries is also a problem for bull trout. The connectivity of westslope cutthroat trout populations in the Bitterroot basin appears to be better than that of bull trout populations, particularly in the main stem of the Bitterroot River and its tributaries. In the East and West Forks, connectivity for both species is considerably better than it is in the main stem of the Bitterroot River.
- The viability of westslope cutthroat trout and bull trout populations on the Forest is difficult to accurately assess.

Environmental Consequences

The action alternative and a "no action" alternative are considered in detail here. The *No Action* alternative would result in an increased risk of dam failure. Dam failure would result in high flows, a large sediment release from the dam and reservoir, and extensive scouring throughout the canyon. This would kill fish and other aquatic animals, and severely degrade aquatic habitat in Mill Creek. Recovery time for the habitat and aquatic biota in the event of dam failure would be more than a decade.

Direct and Indirect Effects of the Action Alternative

There are two primary types of potential impacts related to the action alternative of this project. Fine sediments reaching the stream as a result of construction activities and accidental contamination of the water with fuels or other material, such as wet grout. There is very little potential for either of these impacts to have any affect to fish in Mill Creek or to downstream fish habitat. Occupied cutthroat habitat exists much further upstream than bull trout occupied habitat, which is typical for Bitterroot River tributaries, therefore cutthroat have more potential to be affected (see notes on Map, part 10 of the BE/BA).

The contributing watershed above Mill Lake is approximately 550 acres. Flow from this drainage area in summer would be quite small, barring summer storms. Therefore, containing a spill, in the unlikely event that it occurs, would be feasible without machinery. The distance trout have been observed from the dam is two miles for cutthroat trout and over eight miles for bull trout.

The risk of adverse effects to fisheries and aquatic habitats from spills of toxic materials exists, but the risks of affecting fish or aquatic habitats are considered to be small. The probability of affecting fish is low because of the distance to occupied habitat downstream, helicopters are flown in a controlled manner with safety as a primary

objective, fuels would be stored in containment areas away from standing water, personnel would be present at the worksite to detect the spills and act accordingly, and the amount and size of equipment at the dam site would be relatively small so they don't require large amounts of fuel. Fish and invertebrates are very sensitive to organic solvents as their gills are extremely permeable. Effects occur very quickly when the gas, diesel, or solvent is emulsified into the water. If there is limited turbulence then the hydrocarbons float over the organisms in the water. The really toxic short carbon chains are very volatile and evaporate off very quickly. Organisms in the near shore areas or those that move up through the surface film would be affected in calm waters. Spills into turbulent water increase the mortality of fish. Gasoline mixed into water moves like a gray cloud downstream and the fish kill can be quite complete. The distance is related to the amount and duration of the spill (Anonymous 2002; Lytle and Peckarsky 2001).

Very little ground disturbance or water resource effects are expected to result from the helicopter transport of equipment and personnel to the work site. The helicopter would not need a constructed landing site and refueling would occur off of BNF lands. Crews would camp in an established campsite. The risk of fuels for pumps, generators, and mixers, being spilled would exist. Fuel storage and refueling would be controlled by implementing fuel storage plans and if necessary spill containment plans. Unexpected in-flight emergencies may also occur, but are considered unlikely to occur. These include jettisoning cargo during flight and helicopter accidents.

Some sediment may be eroded from the construction site. The area immediately above the outlet stream would contribute small amounts of sediment that would reach Mill Creek. This would result in minor amounts of sediment reaching the stream, but none would reach occupied fish habitat during the construction season because the nearest observed fish have been approximately two miles downstream.

Cumulative Effects of the Action Alternatives

The areas selected for cumulative effects analysis is the Mill Creek Drainage. This was done because of the headwater location of the project and the intermittent connectivity with other fish subpopulations in other drainages.

The upper watershed of Mill Creek is within the Selway-Bitterroot Wilderness and has experienced little human disturbance other than dam construction, dam operations and annual minor maintenance and periodic major maintenance, trail maintenance, and dispersed camping. Dam operations and maintenance have included the clearing of driftwood and avalanche debris, opening and closing the gate to control water storage and release, and occasional maintenance of the spillway and dam crest. The dam was included in the August 7, 1998, list of ongoing projects determined as "not likely to adversely affect" bull trout. Mill Lake Dam does affect stream flows for an undetermined distance downstream of its location, but the small percentage of watershed area it controls and the timing of releases minimize downstream impacts (USDA Forest Service 2005a).

Trail use by people and stock, camping, and working near the dam, which are within the riparian conservation area, impact the area by compacting soils, adding small amounts of eroded soil, and increasing the potential for weed spread and pollutants (e.g. human wastes). Mill Creek trail was realigned in 2003 and 2004 and work will continue into 2005. This work generally reduced long-term and minor effects of the trail on aquatic habitat by improving drainage. Unauthorized ATV trails at the Forest Service and private land boundary have, and will continue to cause some localized surface erosion in the vicinity. The cumulative effects of trail and recreation activities in the drainage have been very minor, as they tend to be widely distributed over a large area and comprise a small number of disturbed acres.

Fire suppression and prescribed fire have occurred and are likely to continue in the Mill Creek drainage especially near the Forest and private land boundary. Small amounts of commercial timber harvest, including salvage logging has occurred and are expected, but not currently planned, in the foreseeable future. On the Forest, the steep topography and few roads in the drainage limit these types of activities, but they have had, and will continue to have negligible effect on the fish and aquatic habitat in the drainage.

Even after the Blodgett Fire in 2000, the BNF lands of Mill Creek were not a major sediment contributor to the Bitterroot River. Mill Creek, on the BNF, transports relatively small amount of fine sediment (relative to a stream like Rye Creek).

The streamside areas along Mill Creek below the Forest boundary experience a mix of rural and residential activities, and vary from stable and well vegetated to degraded and fairly erosive. In 2004, a restoration project on private land built a reach of channel using heavy equipment. Goals included restoration of a historic meandering-type channel with natural characteristics and improved fish habitat. This section is likely still experiencing minor channel adjustments along with plant growth.

Limited amounts of water reach the Bitterroot River during the summer months, and parts of the stream go dry when irrigation demand is high (most summers). This limits the movement of fishes between the river and Mill Creek. Although, the effects of this activity has not been monitored enough to quantify its affect on fisheries, the effects are suspected to be substantial to native fishes that evolved to the natural variation of flows in Mill Creek and the Bitterroot River.

The use of herbicides in Mill Creek was assessed in the Bitterroot National Forest's 2003 Noxious Weed Treatment Project FEIS. The effects of the Forests activities, with consideration for private actions, were considered to be unlikely to have measurable effects on native fish or aquatic habitats.

To summarize cumulative effects, the proposal is unlikely to transport measurable amounts of fine sediment or other pollutants beyond the area immediately downstream of the dam. The increases in fine sediments would be very unlikely to reach native fish habitat. Channel adjustments, and erosion and sedimentation that occur when channels adjust, would not occur. The potential for negative impacts would also be limited with the

implementation of the mitigation measures. With very little existing human impact in the upper watershed, and slight possibility of substantial effects from this project, even minor changes in aquatic habitat or fish populations in Mill Creek watershed are unlikely.

In 2004, a restoration project on private land built a reach of channel using heavy equipment. Goals included restoration of a historic meandering-type channel with natural characteristics and improved fish habitat. This section is likely still experiencing minor channel adjustments along with growth of stabilizing vegetation, and should be considered a sediment source during high flows.

Summary of Effects to Sensitive, and Threatened or Endangered Fish Species

The action alternative would have no effect on the threatened bull trout and may have minor and short-term detrimental impacts to westslope cutthroat trout habitat. Cutthroat trout is a species on the Regional Forester's sensitive species list. Cutthroat trout viability would not be affected in the Mill Creek drainage or at the Forest scale. Observable effects are likely to be limited to the headwaters of Mill Creek, immediately downstream of the dam. Occupied cutthroat habitat exists much further upstream (closer to the project site) than bull trout occupied habitat, therefore cutthroat have more potential to be affected than bull trout. The duration of the effect on cutthroat habitat may last approximately a year following implementation. No observable changes in fish populations are expected in the short or long-term.

Refer to pages 64 for Consistency and Regulatory framework for fisheries resources

Refer to Appendix G for references.

Wildlife

Analysis Area

The analysis area used for evaluation of effects to wildlife species is the entire Mill Creek drainage west of the National Forest boundary. This drainage provides habitat for wildlife species typically found in coniferous forests of western Montana. Elk, mule deer, and white-tailed deer are resident in the area. Moose occur primarily in or near the creek bottoms and adjacent thickly vegetated north aspects. Mountain goat winter and summer range is found along the steep south-facing cliffs in the area. Other resident species of interest include black bear, mountain lion, coyote, furbearers, and numerous birds and small mammals.

Wildlife habitat in the drainage includes riparian vegetation along Mill Creek, large grassy or rocky openings with scattered ponderosa pine and Douglas-fir on many of the south facing slopes, and extensive areas of montane forest dominated by lodgepole pine, Douglas-fir and sub-alpine fir on the north aspects. With increased elevation, the forest transitions into whitebark pine. In addition to streamside riparian zones, portions of the drainage contain seeps and wallows that provide riparian vegetation associated with high

water table areas. These wet areas are extremely important as microsites providing habitat for small mammals and birds as well as big game species.

There is little known about pre-settlement wildlife population numbers or distribution for this area. Old trapping records and historic journals provide some presence/absence information. Providing diverse habitats that represent naturally functioning ecosystems will maintain the complex of species that would occur in those systems.

Wildlife species and habitat evaluated in this analysis include: Forest Plan management indicator species, Threatened, Endangered and Sensitive species listed for the Bitterroot National Forest, and species of special interest or with unique or limited habitat in the assessment area (mountain goat).

Management Indicator Species

Elk

Existing Condition

A large elk herd winters on both private and National Forest lands on the face between Blodgett and Mill Creeks. There appears to be little winter elk use in Mill Creek itself. Elk use the Mill Creek drainage during the summer to some extent. The Mill Creek drainage is unroaded above the existing trailhead.

Direct and Indirect Effects

Since the analysis area is unroaded and no new road construction would occur under any alternative, there would be no change to existing open road densities, Elk Habitat Effectiveness, or elk security areas. Therefore, there is no need to analyze road densities or Elk Habitat Effectiveness further.

Alternative 1

The No Action alternative would have no direct or indirect effects on elk or elk habitat.

Alternative 2

This alternative would not affect elk habitat percentages or alter existing cover/forage ratios.

Minor disturbance to elk could occur as a result of the construction activities proposed at the dam under this alternative. Helicopter flights to the dam could also disturb elk to some extent. Workers or administrative personnel walking up the trail to the dams would not disturb elk any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to elk.

Cumulative Effects

The analysis area for cumulative effects to elk is the Mill-Blodgett elk herd unit. The existing condition reflects the sum of past activities. Major past activities include construction of the trails and the Forest road system which increased human access to the area and resulted in increased hunting season mortality, and the advent of successful fire suppression which resulted in more cover and less forage habitat than was present historically. Other past activities are listed in Appendix H. Timber harvest outside the Wilderness has reduced the effect of fire suppression to some extent by reducing cover and increasing forage habitat in harvest units. The Blodgett Trailhead fire of 2000 burned into the Mill Creek drainage and created a mosaic of burn intensities in the lower half of the drainage. Most of the area is wilderness or unroaded, so only limited management activities have occurred.

The direct and indirect effects of the alternatives are described above. Neither would appreciably add to nor subtract from the existing cumulative effects to elk. Reasonably foreseeable future projects in the Mill Creek drainage and adjacent areas are listed in Appendix H. These projects would have little or no effect to elk habitat or populations, so would have inconsequential cumulative effects to elk.

Pine Marten

Existing Condition

Pine marten are a Forest Plan Management Indicator Species (MIS) for those wildlife species that are associated with upper elevation mature and overmature forest, including small mammals, which require down and dead woody cover. Upper elevation forests in the Mill Creek area are typically composed of lodgepole pine, sub-alpine fir and Englemann spruce.

Optimum habitat for pine marten includes forests with crown closures greater than 50 percent, where spruce and true firs exceed 40 percent of the total stand composition. At least 20 percent of the forest floor should be littered with downfall greater than 3 inches in diameter. Home range sizes of marten vary based on habitat quality and food availability, but average approximately 600 acres for males and 250 acres for females in Montana (Allen, 1984). To provide sufficient habitat in scarce food years, this area may expand to as much as 1920 acres of suitable habitat in the northern Rocky Mountains.

Good pine marten habitat in the Mill Creek drainage occurs mostly in the creek bottoms and on the lower north aspects above the creek bottoms. A research project conducted by Dr. Kerry Foresman, professor with the Division of Biological Sciences at the University of Montana indicates that marten are relatively common in all of the large creek bottoms dissecting the Bitterroot Mountains that he studied. While Mill Creek was not part of the study area, it is likely that it also contains a sizeable marten population.

There is no need to analyze and calculate Habitat Suitability Indices for marten in this analysis since there is no vegetative manipulation contemplated which would alter the existing condition.

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on marten or their habitat.

Alternative 2

This alternative would not affect existing marten habitat.

Construction activities proposed at the dam under this alternative would not affect marten since the dam is not marten habitat. Helicopter flights to the dams would have little effect on marten, which are largely nocturnal. Workers or administrative personnel walking up the trail to the dams would not disturb marten any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to marten.

Cumulative Effects

The analysis area for cumulative effects to marten is the Mill Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects to marten. Reasonably foreseeable future projects in the Mill Creek drainage are listed in Appendix H. These projects would have little or no effect to marten habitat or populations, so would have inconsequential cumulative effects to marten.

Pileated Woodpecker

The pileated woodpecker is a Forest Plan MIS for those wildlife species that are associated with lower elevation mature and overmature forest, including the primary and secondary cavity nesters that require snags and down woody material as a nesting and foraging component of their habitat. Lower elevation forests in the Mill Creek area are typically composed of ponderosa pine and Douglas-fir, with some black cottonwood mixed in on moister habitats.

Optimum habitat for pileated woodpeckers includes extensive areas that contain large numbers of trees and snags that exceed 20” Diameter at Breast Height (DBH), including some snags that exceed 30” DBH. Ponderosa pine, western larch, and black cottonwood

are the preferred species for nesting. Numerous stumps and abundant down woody material are also important as foraging habitat. Areas above 6,500 feet are considered non-habitat on the Bitterroot National Forest, although sporadic foraging use does occur in some stands above this elevation.

Pileated woodpecker transacts completed annually for the past several years as part of the Forest Plan monitoring effort show highly variable results which do not seem to indicate any particular Forest-wide population trend (USDA, 2004). The closest pileated woodpecker transect to this project is along the trail around Lake Como.

There is no need to analyze and calculate Habitat Suitability Indices for pileated woodpeckers in this analysis since there is no vegetative manipulation contemplated which would alter the existing condition.

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on pileated woodpeckers or their habitat.

Alternative 2

Construction activities proposed at the dam under this alternative would not affect pileated woodpeckers since the dam and surrounding areas are not suitable habitat for this species. Helicopter flights to the dam could potentially disturb pileated woodpeckers to a minor degree. Workers or administrative personnel walking up the trail to the dams would not disturb pileated woodpeckers any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to pileated woodpeckers.

Cumulative Effects

The analysis area for cumulative effects to pileated woodpeckers is the Mill Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the Mill Creek drainage are listed in Appendix H. These projects would have little or no effect to pileated woodpecker habitat or populations, so would have inconsequential cumulative effects to this species.

Threatened and Endangered Wildlife Species

The Forest Plan provides direction regarding Threatened and Endangered wildlife species at II-21.

The U.S. Fish & Wildlife Service lists lynx, bald eagle, gray wolf, and grizzly bear as Threatened and Endangered wildlife species that could occur on the Bitterroot National Forest. The Biological Assessment (BA) for the Mill Lake Dam Project Access 2005 EA also documents expected effects of the proposal to these wildlife species. Short habitat descriptions, known existing conditions for these species within the Mill Creek area and a summary of the effects discussion in the BA are summarized below.

Lynx (*Lynx canadensis*) - Status Threatened

Lynx utilize mature and overmature spruce and subalpine fir forests that contain abundant deadfall for denning and resting. Preferred lynx foraging habitat typically consists of dense stands of sapling-sized conifers that provide good habitat for snowshoe hare, their primary prey species (Ruggiero, et al. 2000). Good lynx habitat consists of a mosaic of both of these structural stages in close proximity. Lynx territories are large, which results in relatively low population densities even in optimal habitat. Lynx abundance and density is partially dependent on cyclic snowshoe hare population fluctuations and on trapping pressure.

Lynx appear to be quite uncommon throughout the Bitterroots, but one was reported in upper Lick Creek in 2000. Some suitable lynx habitat occurs in the upper elevation portions of the Mill Creek drainage, and it is possible that lynx use the area to a limited extent. The high, rocky ridges of the Bitterroot Mountains create barriers to lynx movements between the Mill Creek drainage and adjacent drainages, but there are no barriers to lynx movement created by human activities.

The analysis area is part of the 82,500-acre Big-Mill Lynx Analysis Area (LAU). About 25% of this LAU is classified as lynx habitat, while only 2% of the LAU is classified as lynx foraging habitat. Lack of suitable foraging habitat (primarily dense, 20 to 40 year old conifer stands at mid to upper elevations) is probably a limiting factor for lynx in this LAU.

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on lynx or their habitat.

Alternative 2

This alternative would not affect existing lynx habitat. The dam the lake bed are not suitable lynx habitat.

Construction activities proposed at the dam under this alternative would not affect lynx since the dams and surrounding areas are not suitable habitat for this species. Helicopter flights to the dams could potentially disturb lynx to a minor degree. Workers or administrative personnel walking up the trail to the dams would not disturb lynx any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to lynx.

Cumulative Effects

The analysis area for cumulative effects to lynx is the Big-Mill LAU. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section and in Appendix H.

The direct and indirect effects of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects. Reasonably foreseeable future projects in the Big-Mill LAU are listed in Appendix H. Most of these activities would occur outside of suitable lynx habitat, so would not affect lynx. Those activities within lynx habitat would have little or no effect to lynx habitat. Some could cause minor and temporary disturbance to lynx, but would not affect lynx populations. None would appreciably add to cumulative effects to lynx.

Effects Call

The effects call for lynx is May Effect-Not Likely to Adversely Affect. Project effects to lynx from Alternative 2 were evaluated using the lynx screens contained in the Programmatic Biological Assessment (PBA) For Activities That Are Not Likely to Adversely Affect Threatened and Endangered Terrestrial Species in Montana (USDA, 2005). Because the project meets the lynx screens in the PBA under the Other Special Uses activity type, the programmatic concurrence from USFWS for this PBA satisfies the consultation requirements under Section 7 of the Endangered Species Act. No further consultation with USFWS is necessary.

Bald Eagle (*Haliaeetus leucocehalus*) - Status Threatened

The Bitterroot Valley provides winter and spring/fall habitat for a substantial population of bald eagles. Most of these birds usually arrive in the valley in November and leave the area in February and March for northern breeding grounds. Winter bald eagle use seems to be restricted to the Bitterroot Valley and is concentrated along the river corridor. Wintering bald eagles forage for fish along ice-free portions of the Bitterroot River and also feed on road-killed deer within several miles of the river. Wintering birds generally roost communally in large trees near the river. There are no reports of communal roosts on BNF land outside of this corridor.

The breeding population of bald eagles in the Bitterroot Valley seems to be expanding. All known nests are along the Bitterroot River, with the exception of one nest near Lake

Como. At least five bald eagle nests in the Bitterroot valley were active in 2004, and fledged a total of at least eight young. Migrating eagles are sometimes seen soaring over BNF land during the spring and fall, but these birds would not use Mill Lake for foraging because the lake contains no fish.

It is remotely possible that bald eagles could establish a winter roost site low in the Mill Creek area sometime in the future, but the area is generally not considered to be bald eagle habitat. Mill Lake does not provide suitable nesting habitat for bald eagles because it stays frozen until late in the nesting season, and contains no fish that could provide a forage base.

Direct, Indirect and Cumulative Effects

None of the alternatives would have any direct, indirect or cumulative effects to bald eagle habitat or populations since the project area does not contain suitable eagle nesting or foraging habitat, and no bald eagle territories occur in the Mill Creek drainage.

Effects Call

The effects call for bald eagles for Alternative B in the Biological Assessment is No Effect, because the project is not located within a bald eagle nest site management zone (USDI, 1994). No consultation with USFWS is necessary.

Gray Wolf (*Canis lupus*) - Status Endangered (Non-essential, experimental)

The entire BNF including the analysis area is part of the Central Idaho Non-essential, Experimental Population Area (CINEPA) designated by USFWS (USDI 1994). Wolves within this area are treated as a population proposed for listing rather than as a listed species under Section 10(j) of the ESA. There is no critical habitat designated within the CINEPA, and no land use restrictions are to be applied after six or more wolf packs occupy the area.

USFWS reintroduced Canadian wolves in the Frank Church Wilderness in Idaho in 1995 and 1996. These wolves and their progeny have since dispersed widely through northern Idaho and western Montana. Wolf numbers in the CINEPA have increased faster than predicted, and are now well past the levels required to meet the recovery goals. There is some evidence that wolves resulting from the reintroduction have passed through the Mill Creek drainage, but there has been no evidence of wolves denning nearby. There were 37 known packs within the CINEPA at the end of 2004 (USDI 2005).

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on wolves or their habitat.

Alternative 2

This alternative would not affect existing wolf habitat or known den sites. There is a small chance that construction activities and/or helicopter flights to the dams could potentially disturb wolves to a minor degree if any happened to be in the area. Workers or administrative personnel walking up the trail to the dams would not disturb wolves any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to wolves.

Cumulative Effects

The analysis area for cumulative effects to wolves is the Bitterroot Mountains. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section and in Appendix H. The direct and indirect effects of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects to wolves. Reasonably foreseeable future projects in the Mill Creek area are listed in Appendix H. Foreseeable future projects in areas farther to the north and south of Mill Creek are similar in scale to those in Appendix H, especially in the wilderness. Fuel reduction projects that include prescribed fire, thinning and timber harvest may occur in some areas outside the wilderness, although the only one that is reasonably foreseeable at this point is the Trapper-Bunkhouse project south of Lake Como. Some of these projects would change the existing habitat to some degree, but this would have little effect to wolves since they are habitat generalists. None of these future projects would appreciably add to cumulative effects to wolves.

Effects Call

The effects call for gray wolves for Alternative 2 in the Biological Assessment is Not Likely to Jeopardize the Continued Existence of the Species or Result in Destruction or Adverse Modification of Proposed Critical Habitat. The rules for management of the Central Idaho Non-essential, Experimental population of gray wolves specify that no land use restrictions are to be applied after six or more wolf packs occupy the CINEPA (USDI 1994). As of December 2004, there were at least 37 known wolf packs within the CINEPA (USDI 2005). No consultation with USFWS is necessary.

Grizzly Bear (*Ursus arctos*) - Status Threatened

Grizzly bears are habitat generalists that occupied portions of the Bitterroot drainage historically, but were essentially extirpated from the drainage by the 1930s. The U.S. Fish and Wildlife Service (USFWS) currently classifies grizzlies as a possible transient in the Bitterroot NF . The only recent confirmed sighting of a grizzly bear in the Bitterroot drainage was an apparent transient bear that was seen on private land southeast of Stevensville in late September, 2002 after apparently crossing the Sapphire range from Rock Creek. The origin of this bear is uncertain, since no other grizzly bears had been confirmed in either Rock Creek or the Sapphire Range for many years.

The Mill Creek Dam analysis area is included in both the Bitterroot Grizzly Bear Recovery Zone designated by USFWS (USDI 1993), and the more recent Bitterroot Grizzly Bear Experimental Population Area designated by USFWS (USDI 2000).

USFWS authorized reintroduction of grizzly bears into the Selway-Bitterroot ecosystem under a non-essential, experimental population designation (USDI 2000), but the reintroduction effort is currently on indefinite hold for political reasons. The analysis area is suitable grizzly habitat from the standpoint of the existing vegetation, and it is possible that grizzlies could use the Mill Creek drainage to some extent if they did reoccupy the Selway-Bitterroot ecosystem.

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on grizzly bears or their habitat.

Alternative 2

This alternative would not affect existing grizzly bear habitat, and there would be no effects to critical habitat designated in a recovery plan. Project activities would not affect grizzly bear populations since none occur in the Bitterroot Mountains at this time.

Cumulative Effects

The analysis area for cumulative effects to grizzly bears is the Bitterroot Grizzly Bear Experimental Population Area. The existing condition reflects the sum of past activities. For grizzly bears, these include: trapping and poisoning, which directly reduced grizzly numbers; construction of an extensive forest road system which improved human access and made grizzlies more vulnerable to hunting and disturbance; and fire suppression, which resulted in denser forests that reduced productivity and availability of grizzly forage plants. Timber harvest tended to reverse this trend, but has occurred on relatively few acres. Overall, habitat conditions for grizzly bears have declined across the Forest. To the best of our knowledge, there have been no resident grizzly bears on the Forest for more than 50 years.

The direct and indirect effects of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects for grizzly bears. Reasonably foreseeable future projects in the Mill Creek area are listed in Appendix H. Foreseeable future projects in areas farther to the north and south of Mill Creek are similar in scale to those in Appendix H, especially in the wilderness. Fuel reduction projects that include prescribed fire, thinning and timber harvest may occur in some areas outside the wilderness, although the only one that is reasonably foreseeable at this point is the Trapper-Bunkhouse project south of Lake Como. Some of these projects would

change the existing habitat to some degree, but these sorts of changes would largely benefit grizzly bears since they would create additional bear forage. None of these future projects would affect grizzly populations, so none would add to cumulative effects to grizzly bears.

Effects Call

The effects call for grizzly bears for Alternative 2 in the Biological Assessment is No Effect because the project would not change existing grizzly bear habitat, and no grizzly bears currently occupy the Bitterroot Mountains. No consultation with USFWS is necessary.

Sensitive Species

The Forest Plan provides direction regarding Sensitive wildlife species at II-21. Sensitive wildlife species are those animal species identified by the Regional Forester for which population viability is a concern, as evidenced by:

-Significant current or predicted downward trends in population numbers or density.

-Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Management goals for sensitive species are to maintain viable populations of a species throughout its existing range within the planning area (FSM 2670.5 19, 28). The planning area is the Bitterroot National Forest, not the project area. Special management emphasis is provided to ensure sensitive species viability and preclude trends toward endangerment that would result in the need for Federal listing as Threatened or Endangered under the Endangered Species Act of 1973. A biological evaluation must be conducted to determine the effects of proposed actions on sensitive species.

Suitable habitat exists within the Mill Creek drainage for a number of the sensitive wildlife species listed as possibly occurring on the BNF. There is no known suitable habitat within the Mill Creek drainage for northern bog lemmings (no sphagnum bogs), northern leopard frogs (no ponds with emergent vegetation at low elevations) or Townsend's big-eared bat (no caves or mine adits), so these species are not expected to occur in the drainage. The Biological Evaluation (project file) documents expected effects of the preferred alternative to sensitive wildlife species known or suspected to occur within the analysis area.

Peregrine Falcon (*Falco peregrinus*)

Peregrine falcons typically nest on ledges in high inaccessible cliff faces (or tall buildings when introduced in an urban setting) which dominate the surrounding area, and forage for avian prey in open habitats including prairie, tundra, open forests and over marshes and lakes (Dobkin, 1992; Reel et al., 1989). Habitat surveys for the Bitterroot National Forest identified suitable nesting sites along the west side of the valley on numerous cliffs in or adjacent to the Selway-Bitterroot Wilderness.

Peregrine falcons were reintroduced to the Bitterroot Mountains through a series of releases of captive-bred birds between 1989 and 1993. There are now a number of known or suspected peregrine falcon breeding territories established in the Bitterroot Mountains between Florence and Painted Rocks Reservoir. Peregrine falcons have nested in the cliffs near the mouth of Mill Creek canyon every year since we found them there in 2000. Birds from this eyrie appear to hunt mostly out in the Bitterroot Valley, but may occasionally fly up the canyon towards Mill Lake. The birds typically return to the eyrie by late March, and begin incubation near the beginning of May. The young typically fledge during the first week of July, and begin to drift away from the canyon by early August.

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on peregrine falcons or their habitat.

Alternative 2

This alternative would not affect existing peregrine falcon habitat. Construction activities at the dam would not affect peregrines foraging in the area. Helicopter flights past the eyrie cliff could disturb peregrine falcons if the flights occur during the nesting season. Helicopter flights during the nesting season should stay as far south in the canyon as is safely possible to limit disturbance. Helicopter flights after the middle of August would have little effect to peregrine falcons.

Cumulative Effects

The analysis area for cumulative effects to peregrine falcons is the Mill Creek drainage. The existing condition reflects the sum of past activities. For peregrines, these are largely confined to shooting and the use of DDT, which were directly responsible for dramatic declines in peregrine populations across the continent, and the subsequent reintroduction of captive-bred peregrines to formerly occupied habitat. Populations across the country have rebounded to the point that the species was removed from the Threatened and Endangered Species List in 2000.

The direct and indirect effects of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects for peregrine falcons. Reasonably foreseeable future projects in the Mill Creek drainage are listed in Appendix H. None of these projects would affect habitat for peregrine falcons. Projects that involve helicopter flights up Mill Creek canyon could disturb peregrine falcons if they occur during the nesting season, but these effects would be minor and temporary and would not affect peregrine falcon populations if mitigated correctly. Future disturbance could result in very minor additional cumulative effects to peregrine falcons.

Flammulated owl (*Otus flammeolus*)

Flammulated owls are associated with mature to old growth ponderosa pine/Douglas-fir forests in the Rocky Mountains. They are secondary cavity nesters and depend on woodpeckers for their nesting holes. This species is insectivorous and migratory, spending the winters in Mexico and Central America (Atkinson and Atkinson, 1990; Goggans, 1986).

Flammulated owls have been documented in several areas of the Forest, most of which are south of Darby. One flammulated owl was reported in the Blodgett Creek drainage in 1992. A limited amount of apparently suitable flammulated owl habitat occurs within the Mill Creek drainage in some of the lower elevation mature and over-mature ponderosa pine and Douglas-fir stands on the south aspects, although much of this habitat burned in 2000. A graduate student from the University of Montana conducted flammulated owl surveys along the Cow Creek road just north of Mill Creek canyon in 1994 as part of the field work for her Master's degree, but detected no flammulated owls (Wright, 1996).

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on flammulated owls or their habitat.

Alternative 2

This alternative would not affect existing flammulated owl habitat, which is restricted to the lower few miles of the trail.

Construction activities proposed at the dam under this alternative would not affect flammulated owls since the dam and the surrounding area are not suitable habitat for this species. Helicopter flights to the dams would have little effect on flammulated owls, which are almost strictly nocturnal. Workers or administrative personnel walking up the trail to the dams would not disturb flammulated owls any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to flammulated owls.

Cumulative Effects

The analysis area for cumulative effects to flammulated owls is the Mill Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects to flammulated owls. Reasonably foreseeable future projects in the Mill Creek area are listed in Appendix H. These projects would have little or no effect to flammulated owl habitat or populations, so would have inconsequential cumulative effects to this species.

Black-backed woodpecker (*Picoides arctus*)

Black-backed woodpeckers are opportunistic feeders typically associated with mid to high elevation coniferous forests in the northern Rocky Mountains. This species is highly mobile and tends to concentrate in areas of recent bark beetle irruptions, especially those following forest fires. Snag concentrations seem to be more critical for winter foraging than for summer foraging. Small flocks of black-backed woodpeckers often seen in snag patches in the winter seem to disperse during the summer, probably due to territoriality associated with nesting. Declines in population numbers of this species may be due to a relative scarcity of large areas of snags as fire suppression has become effective over the past 80 years (Hutto, 1995).

This species may be present in low densities throughout the BNF, but becomes relatively common in some recently burned areas where most of the trees are dead. Large areas within the Mill Creek drainage were burned during the Blodgett Trailhead fire in August of 2000. Forest personnel have documented black-backed woodpeckers in the burned forest along the lower several miles of the Mill Creek trail several times since the fire.

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects to black-backed woodpeckers.

Alternative 2

This alternative would not affect existing black-backed woodpecker habitat, which is restricted to the recently burned area in the lower half of the Mill Creek canyon and the adjacent east-facing slopes to the north and south of Mill Creek.

Construction activities proposed at the dam under this alternative would not affect black-backed woodpeckers since the dam and the surrounding area are not suitable habitat for this species. There is a small chance that the helicopter flights to the dams could

potentially disturb black-backed woodpeckers to a minor degree. Workers or administrative personnel walking up the trail to the dams would not disturb black-backed woodpeckers any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to black-backed woodpeckers.

Cumulative Effects

The analysis area for cumulative effects to black-backed woodpeckers is the Mill Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects to black-backed woodpeckers. Reasonably foreseeable future projects in the Mill Creek drainage are listed in Appendix H. These projects would have little or no effect to black-backed woodpecker habitat or populations, so would have inconsequential cumulative effects to this species.

Fisher (*Martes pennanti*)

Fishers in the northern Rocky Mountain area are associated with mature and overmature coniferous forests that have relatively closed canopies. Optimal habitat conditions include crown closures greater than 50%, average tree diameter greater than 10" and 2 or more canopy layers. Fisher use interspersed cover and edges of openings for foraging and are able to utilize early seral stages of vegetation more readily than martens. Fisher show a strong affinity for forested riparian areas throughout the year (Jones 1991).

Fishers depend on down woody material to provide subnivean dens in winter. Extensive fire or clearcutting may reduce habitat values especially during winter because lack of overhead cover permits greater snow depths. Uneven age timber management may improve habitat by increasing prey density and the number of den sites (Jones 1991, Douglas and Strickland, 1987). Important prey species include snowshoe hares, voles and pine squirrels. Prey availability and trapping pressure have the most effect on fisher abundance and density.

Fishers are occasionally sighted in many of the Bitterroot canyons, and it is likely that they occupy most of the canyon bottoms in the Bitterroots (Foresman, pers. comm. 2002). Suitable fisher habitat occurs along most of the length of Mill Creek and on many of the north aspects. The presence of suitable habitat and known fisher populations in nearby drainages and over the Bitterroot Divide in Idaho makes it likely that fisher inhabit the Mill Creek drainage, but no sightings have been reported.

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on fisher or their habitat.

Alternative 2

This alternative would not affect existing fisher habitat.

Construction activities proposed at the dam under this alternative would not affect fisher since the dam is not fisher habitat. Helicopter flights to the dam would have little effect on fisher, which are largely nocturnal. Workers or administrative personnel walking up the trail to the dams would not disturb fisher any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to fisher.

Cumulative Effects

The analysis area for cumulative effects to fisher is the Mill Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects to fisher. Reasonably foreseeable future projects in the Mill Creek drainage are listed in Appendix H. These projects would have little or no effect to fisher habitat or populations, so would have inconsequential cumulative effects to fishers.

Wolverine (*Gulo qulo*)

The US Fish and Wildlife Service (USFWS) recently received a petition to list the wolverine as Threatened or Endangered throughout its range. The USFWS review process will take several years. In the interim, the wolverine has no legal status under the Endangered Species Act. However, the Regional Forester's Sensitive Species List includes the wolverine as a Sensitive species on the Bitterroot National Forest and throughout Region One.

Wolverines are solitary animals that range widely over a considerable variety of habitats. Habitat requirements tend to include large, isolated roadless areas that support a diverse prey base. Within such areas, wolverine use appears to be concentrated in areas of medium to scattered mature timber and in ecotonal areas around natural openings such as cliffs, slides, basins and meadows. There seems to be little use in stands of dense young timber or in actual openings such as clearcuts or wet meadows (Reel, et al. 1989; Butts, 1992).

Wolverine home ranges are very large, averaging approximately 150 square miles in Montana. Wolverine feed primarily on rodents and carrion, although they are opportunists and will also consume berries, insects, fish, birds and eggs when available. Ungulate carrion seems to be particularly important in the winter, and wolverine movement to lower elevations during winter may be to take advantage of ungulate mortalities on winter ranges (Reel, et al. 1939; Butts, 1992). Ungulate carcasses attributable to wounding losses during hunting season also appear to be important food sources for wolverines during the winter at all elevations.

Recent sightings of wolverines in the Bitterroot Range include animals in Lost Horse, Camas and Sweathouse Creeks. A Forest employee spotted a wolverine in the Mill Creek drainage near Lockwood Lake in July 2003. Suitable wolverine denning habitat exists in the higher basins within the Mill Creek drainage. Wolverine could also utilize the lower portions of the drainage during the winter. Wolverine apparently use the drainage to some extent, although the entire analysis area would constitute only a small portion of the home range of one wolverine.

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on wolverine or their habitat.

Alternative 2

This alternative would not affect existing wolverine habitat or den sites. There is a small chance that construction activities at the dam and/or helicopter flights to the dam could potentially disturb wolverine to a minor degree if any happened to be in the area. Helicopter flights would not disturb wolverine dens since none would occur during the winter denning season. Workers or administrative personnel walking up the trail to the dams would not disturb wolverine any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to wolverine.

Cumulative Effects

The analysis area for cumulative effects to wolverine is the Bitterroot Mountains. The existing condition reflects the sum of past activities. Major types of past activities in this area are described in the elk section. The direct and indirect effects of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects to wolverine. Reasonably foreseeable future projects in the Bitterroot Mountains are listed in the Burned Area Restoration EIS (USDA Forest Service, 2001). The analysis area for cumulative effects to wolves is the Bitterroot Mountains. The existing condition reflects the sum of past activities. Major types of past activities in this

area are described in the elk section and in Appendix H. The direct and indirect effects of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects to wolverine. Reasonably foreseeable future projects in the Mill Creek area are listed in Appendix H. Foreseeable future projects in areas farther to the north and south of Mill Creek are similar in scale to those in Appendix H, especially in the wilderness. Fuel reduction projects that include prescribed fire, thinning and timber harvest may occur in some areas outside the wilderness, although the only one that is reasonably foreseeable at this point is the Trapper-Bunkhouse project south of Lake Como. Some of these projects would change the existing habitat to some degree, but this would have little effect to wolverine since they are habitat generalists. None of these projects would affect wolverine populations because they range over such a large area. Foreseeable future projects would have inconsequential cumulative effects to wolverine.

Coeur d'Alene salamander (*Plethodon idahoensis*)

This small terrestrial salamander is generally found below 5,000 feet in elevation in seeps, spray zones and splash zones of waterfalls along streams and creeks. They occur in wet, humid and cool microhabitats containing fractured bedrock or large boulders that provide shelter and retain moisture. Dense tree canopy over cascading creek sites is an important habitat component because it moderates surface and water temperatures. These salamanders remain subsurface during the day. They hibernate underground from November to April. Removal of overstory vegetation, increases in water temperature, changes in water table and flow, and physical disturbance of talus or rock habitat can affect Coeur d'Alene salamander populations.

Recent surveys have documented Coeur d’Alene salamanders at several sites in the Bitterroot Range, including Sweathouse, Rock and Chaffin Creeks (Maxell, 2004). The distance between these locations indicates that this species may be widespread in suitable habitat in the Bitterroots, although earlier surveys in other drainages did not detect any individuals (Genter, et al. 1988). There is some suitable habitat in Mill Creek, and it is possible that this species occurs in the drainage. Mill Creek Falls was surveyed for this species in 1988 (Genter, et al. 1988), but no individuals were found.

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on Coeur d’Alene salamanders or their habitat.

Alternative 2

This alternative could affect existing Coeur d’Alene salamander habitat in Mill Creek by altering water flows and/or by adding sediment to the creek during dam repair work. Most of these changes would be minor and temporary, and none would result in any lasting adverse effects to Coeur d’Alene salamanders. The potential for project activities

to affect individual salamanders is somewhat limited because this species spends most of its time in damp habitats along creeks rather than in the creeks themselves. Other project activities such as helicopter flights would not affect this species.

Cumulative Effects

The analysis area for cumulative effects to Coeur d'Alene salamanders is the Mill Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area include construction of the dams on Mill, Hauf, Sears and Lockwood Lakes that led to changes in water flow regimes, road construction and subdivision on private land lower in the drainage, and irrigation withdrawals that reduced flows in the lower parts of the stream. Other past activities are listed in Appendix H. The direct and indirect effects of the alternatives are described above. The action alternative could temporarily add to past cumulative effects by altering flow regimes and/or increasing sedimentation rates. Reasonably foreseeable future projects in the Mill Creek drainage are listed in Appendix H. Some of these projects could have similar minor effects to Coeur d'Alene salamanders as the current project. Overall, future projects would have inconsequential cumulative effects to this species.

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Northern Goshawk (*Accipiter gentilis*)

Nesting habitat for goshawks is typically described in the scientific literature as mature to over-mature forest with a canopy closure exceeding 60% and tree stem density exceeding 195 trees/acre (Reynolds, et al. 1982). Most of the goshawk nests we have located on the BNF over the last few years are in stands which are younger and somewhat more open. Nests on the BNF tend to be at low to mid elevations, often in Douglas-fir habitat types on cooler aspects. Goshawks occupy large territories, and are generalists when it comes to foraging habitat, but natural and/or created openings are usually present within the forest matrix.

No goshawk territories are known to occur within the Mill Creek drainage, but one or more may exist.

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on goshawks or their habitat.

Alternative 2

This alternative would not affect existing goshawk habitat.

Construction activities proposed at the dam under this alternative would not affect goshawks since the dam and lake bed are not suitable habitat for this species. Helicopter

flights to the dams could potentially cause minor disturbance to nesting goshawks, but effects would be limited because the flights would be high above the canopy. Workers or administrative personnel walking up the trail to the dams could disturb goshawks if a nest was located near the trail, but any such disturbance would be similar to that caused by any other hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to goshawks.

Cumulative Effects

The analysis area for cumulative effects to goshawks is the Mill Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area are described in the elk section.

The direct and indirect effects of all of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects to goshawks. Reasonably foreseeable future projects in the Mill Creek drainage are listed in Appendix H. These projects would have little or no effect to goshawk habitat or populations, so would have inconsequential cumulative effects to this species.

Boreal (or Western) Toad (*Bufo boreas*)

Boreal toads are habitat generalists that may occur from lower elevation grasslands up to timberline as adults. They are dependent on ponds, slow streams or other standing water for successful reproduction, but adults can travel a considerable distance from breeding sites, and are well-distributed across the Forest. Mill Creek on the Forest is generally too fast to provide breeding habitat for toads, although there may be an occasional backwater or small pond that might be suitable. Mill Lake probably does not support successful reproduction because they contain fish that prey on tadpoles, and also because of the seasonal drawdowns to meet irrigation demands. Boreal toads could potentially occur throughout the Mill Creek drainage as adults, although the high elevation and high snowpack inherent in the area around Mill Lake make it unlikely that this area is important toad habitat.

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on toads or their habitat.

Alternative 2

This alternative could affect existing boreal toad habitat in Mill Creek by altering water flows and/or by adding sediment to the creek during dam repair work. Most of these changes would be minor and temporary, and none would result in any lasting adverse effects to boreal toads. The potential for construction activities to affect individual toads

is limited because this species does not breed in the fast currents that characterize Mill Creek on the Forest. Adult toads are scattered across the Forest in a variety of habitats, and are unlikely to be affected by activities limited to the trail and dam areas. Other project activities such as helicopter flights would not affect this species.

Cumulative Effects

The analysis area for cumulative effects to boreal toads is the Mill Creek drainage. The existing condition reflects the sum of past activities. Major past activities in this area include construction of the dams on Mill, Hauf, Sears and Lockwood Lakes that led to changes in water flow regimes, road construction and subdivision on private land lower in the drainage, and irrigation withdrawals that reduced flows in the lower parts of the stream. The direct and indirect effects of all of the alternatives are described above. The action alternative could temporarily add to past cumulative effects by altering flow regimes and/or increasing sedimentation rates. Reasonably foreseeable future projects in the Mill Creek drainage are listed in Appendix H. These projects would have little or no effect to boreal toad habitat or populations, so would have inconsequential cumulative effects to this species.

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Effects Calls for Sensitive Wildlife Species

See the Biological Evaluation in the Project File for further information and effects calls for sensitive wildlife species. The effects call is May Impact Individuals or Habitat, but Will Not Likely Result in a Trend Toward Federal Listing or Reduced Viability for species that the alternative descriptions above list as being affected to some degree by implementation. This effects call applies to peregrine falcon, flammulated owl, black-backed woodpecker, fisher, wolverine, Coeur d'Alene salamander, northern goshawk and boreal toads. The effects call for all other sensitive species is No Impact.

Other Wildlife Species

Mountain Goat (Oreamnos americanus)

Good mountain goat habitat is widespread along the steep, rocky canyon walls in the Mill Creek drainage. A small herd of mountain goats winters in lower portions of the drainage and uses the high elevation basins as summer range (Smith, 1973). The majority of goat use occurs on the open, south facing aspects. Ground-based human activity can disturb goats in hunted populations such as that in the Bitterroots, but they seem to be much more disturbed by aircraft flying low overhead (Nielsen 1995, pers. comm.).

Direct and Indirect Effects

Alternative 1

The No Action alternative would have no direct or indirect effects on goats or goat habitat.

Alternative 2

This alternative would not affect goat habitat, although goats sometimes lounge on the tops of some of the wilderness dams in the Bitterroot Mountains.

Helicopter flights to the dam could potentially disturb goats if the helicopter passed low over the goats, and especially if it hovered over them. Individual goats could be injured or killed by if they panicked and ran across rock faces. Mitigations requiring helicopter pilots to avoid goats will greatly reduce the chances of such disturbance.

Minor disturbance to goats could occur as a result of the construction activities proposed at the dam under this alternative. Workers or administrative personnel walking up the trail to the dams would not disturb goats any more than a hiking party. Any of these disturbances would be minor and temporary, and none would result in any lasting adverse effects to goats.

Cumulative Effects

The analysis area for cumulative effects to goats is the Mill Creek drainage. The existing condition reflects the sum of past activities. Major past activities include construction of the trails and the Forest road system which increased human access to the area and resulted in increased hunting season mortality, and the advent of successful fire suppression which resulted in more cover and less forage habitat than was present historically. This is especially prevalent on the lower, south slopes in the canyons that the goats use for winter range. Much of the forest along the lower part of Mill Creek was killed by high-intensity fire during the Blodgett Trailhead fire in 2000. Most of the area is wilderness or unroaded, so only limited management activities have occurred.

The direct and indirect effects of the alternatives are described above. None would appreciably add to nor subtract from the existing cumulative effects for mountain goats. Reasonably foreseeable future projects in the Mill Creek drainage are listed in Appendix H. These projects would have little or no effect to mountain goat habitat. Some could cause minor and temporary disturbance to goats, but would not affect goat populations. None would appreciably add to cumulative effects to mountain goats.

Refer to pages 64 to 66 for Consistency and Regulatory framework for wildlife resources

Refer to Appendix G for references.

Plants – Sensitive Species

Introduction

An evaluation of threatened, endangered, and sensitive plant species for the Mill Lake Dam Rehabilitation Project was conducted in order to determine species most likely to be affected by proposed activities. The following list was compiled of sensitive plant species that either were known to occur within the project area or had the potential to occur in the area:

Rocky Mountain paintbrush	*Castilleja covilleana*
Idaho douglasia	*Douglasia idahoensis*
Rough fleabane	*Erigeron asperugineus*
Western boneset	*Eupatorium occidentale*
Bitterroot bladderpod	*Lesquerella humilis*
Old man's beard	*Nodobryoria subdivergens*
Storm saxifrage	*Saxifraga tempestiva*

Existing Condition

Species listed above that are found 15 to 30 miles to the north of the project area include Bitterroot bladderpod, rough fleabane, old man's beard, storm saxifrage and western boneset. There are populations of Bitterroot bladderpod on St. Mary's Peak, East and main St. Joseph Peaks, and at Bass Lake Dam. Rough fleabane and old man's beard (a hair lichen) have also been found on St. Mary's Peak and storm saxifrage has been found on East St. Joseph Peak. Western boneset has been found on talus slopes below St. Mary's Peak in the Silverthorne Creek drainage. None of these species were found in the Mill Lake Dam project area during surveys, although potentially suitable habitat does exist for Bitterroot bladderpod based on the location on a similar site at Bass Lake Dam.

Rocky Mountain paintbrush is found much further to the south on the West Fork and Sula Ranger Districts. Idaho douglasia has only been found in the Idaho portion of the Selway-Bitterroot Wilderness. Potentially suitable habitat exists for these species on the dam site but neither species was found during plant surveys.

Populations of Bitterroot penstemon *(Penstemon flavescens),* a species of interest on the Bitterroot National Forest, were found along the Mill Creek Trail and at Mill Lake. This species is tracked by the Montana Natural Heritage Program because it is endemic to the Bitterroot Mountains of Idaho and Montana. It is considered to be potentially at risk due its limited range but populations at most sites are abundant.

Environmental Consequences

Alternative 1 - No Action

Direct, Indirect, and Cumulative Effects
There should be no impacts on sensitive plants or their habitat as a result of the No Action Alternative other than the impacts on the trail used for access and impacts due to minor repair work.

Alternative 2 – Proposed Action

Direct and Indirect Effects
The proposed action will not impact any sensitive plants since none were found in the area of proposed activities. There is some potentially suitable habitat for Bitterroot bladderpod in the vicinity of the dam, but the proposed activities should not occur in areas not previously disturbed so there should not be any adverse impacts on bladderpod habitat either. There will be no borrow pits excavated so there will be no impacts on bladderpod habitat as a result of obtaining fill material.

Cumulative Effects
There is no way of knowing the historical distribution of plant species in the area since the dam was originally constructed in 1895. Most likely the amount of disturbance involved in dam construction was not sufficient to impact the viability of any plant species. Surveys in 1994 revealed the Bitterroot penstemon population is scattered for about ¾ mile along the newly constructed trail (constructed in 1994) from just west of where the Heinrich Lake drainage crosses the trail to Mill Lake Dam. About 200 plants in total were counted at the time of the survey. Other populations of Bitterroot penstemon have been found on the Forest including a population about five miles east of Mill Lake adjacent to Hauf Lake, and others along the St. Mary's Peak Trail, on the ridge between McCalla and Big Creeks, on the ridge above Glen Lake and north of Missoula near Hoodoo Pass. There are probably other locations of Bitterroot penstemon throughout the Bitterroot Range that haven't been recorded.

Summary of Effects to Sensitive Plant Species

The project would have no effect on any Bitterroot Forest Sensitive Plant species or their habitat. Bitterroot penstemon was found along the Mill Creek Trail from about ¾ mile east of the dam up to the dam itself. This is a species of Special Interest on the Forest since it is endemic to the Bitterroot Mountains. Most known populations of Bitterroot penstemon are located within the Selway-Bitterroot Wilderness or along trails accessing the wilderness, affording a large degree of protection to overall species' viability.

Noxious Weeds

Existing Condition

There were no noxious weeds found at the Mill Lake Dam site and the elevation and climate would normally be a natural protection against weed invasions. However, major disturbances like trail construction, long-term camping, horse use, and wilderness dam repairs can result in introducing weeds such as spotted knapweed *(Centaurea biebersteinii)*.

See P. 66 and 67 for regulatory consistency.

Environmental Consequences

Alternative 1 – No Action

Direct, Indirect and Cumulative Effects
The No Action Alternative would have little effect on the introduction and spread of noxious weeds. There would be some risk of weed spread as a result of routine maintenance but not to the extent of the action alternatives.

Alternative 2 – Proposed Action

Direct and Indirect Effects

The Proposed Action has the potential to spread noxious weeds unless preventive measures are used to avoid weed introduction. The Forest Service Manual has requirements and recommendations for preventing the risk of noxious weed spread (FSM 2080). There is a potential for weed seed to be transported into the dam site via helicopter or on equipment and supplies transported via helicopter or stock. All equipment and supplies should be inspected and cleaned of weed-seed prior to entering the wilderness. All stock should be fed weed-free feed. Seeding should be minimized in order to reduce the risk of introducing non-native species. If disturbance is sufficient to warrant revegetation of bare ground locally native seed should be used. Use borrow areas that are not vegetated if possible to reduce the potential for needing seeding or revegetation (see sensitive plant report).

Cumulative Effects

The Mill Lake Dam area is currently weed-free although there are scattered spotted knapweed plants along the Mill Creek Trail particularly near the trailhead. Weed control efforts including spot spraying with herbicides followed by an Adopt-a-Trail weed-pulling program on this trail have helped reduce the knapweed population considerably. At this point only scattered spotted knapweed plants exist along the trail, which should be easily controllable by pulling. However, there are more plants at the trailhead and this will be a constant source of seed to transport along the trail. Using weed prevention

measures at the dam site should reduce the risk of introducing spotted knapweed seed while completing repair work.

Refer to pages 66 - 67 for Consistency and Regulatory framework for plants and noxious weeds resources

Refer to Appendix G for references

Heritage Resources –

The Mill Lake Dam has been determined Not Eligible for the National Register of Historic Places. No other Heritage sites have been located within the proposed project area. The Mill Lake Dam rehabilitation and access activities will have no adverse effect on Heritage resources. PF D-9.

Refer to pages 67 for Consistency and Regulatory framework for heritage resources

Air Quality Considerations –

Air quality regulations allow omission of certain pollution sources in air quality analyses if they are considered very minor and are certain to have no detrimental effects. These sources are considered to emit pollutant amounts below *de minimus* levels. Air pollution sources that pass the de minimus test do not need to be included in air pollution impact analyses. (Peterson). The level of aircraft activity and emission associated with the helicopter trips is considered to be below de minimus levels and no further analysis is needed. On site equipment, such as grout pumps and water pumps will operate on gas, but are expected to produce emissions below de minimus levels as well, and no further air quality analysis is needed.

There would be no effects to air quality within the Class I area (Selway-Bitterroot Wilderness) as a result of this project. PF D-16.

Refer to pages 67 - 68 for Consistency and Regulatory framework for air resources

Refer to Appendix G for references

CONSISTENCY WITH LAW, REGULATIONS, POLICY OR FOREST PLAN

Dam Safety - Regulatory Consistency

Alternative 1 is not consistent with dam safety laws, regulations and policy associated with the deteriorated condition of the outlet works. If the corrugated metal pipe is left to deteriorate, this condition could lead to a potentially hazardous situation or an emergency condition of the dam that threatens people or property downstream of the dam.
In addition, corrugated metal pipe is subject to corrosion and therefore "restricted to moderate hazard class D and low hazard class C and D dams, unless otherwise approved by the Regional Staff Director for engineering activities" (FSM 7524.45 Outlet Works). Because Mill Lake Dam is a high hazard dam, corrugated metal pipe is not recommended for this service.

Alternative 2 is consistent with dam safety laws, regulations and policy because the deteriorated and unacceptable corrugated metal pipe will be slip-lined using state of practice materials and techniques. This repair will correct the deficiency of the corroded pipe by slip-lining and grouting around a new pipe that is suitable for this service (expected pressure and flow capacity, resistance to corrosion, embankment loading conditions, etc.) The repair is expected to lengthen the performance life and ensure the integrity of the outlet works, and prevent a potentially hazardous condition of the dam from developing in the future.

Refer to Appendix A for discussion of authorities to regulate dams on National Forest System Lands.

Access and Easements Regulatory Framework

See pages 3 and 4, and Appendix D for discussion of legal rights MCID has to access Mill Lake Dam and of valid pre-Forest easements recognized under the Act of 1866 granted by the Secretary of the General Land Office/Department of Interior.

Wilderness - Regulatory Consistency

The Wilderness Act of 1964 does not specifically address the method of access to wilderness dams. It does however, specifically address "valid occupancies" such as Mill Lake Dam. In Section 5(b) it states "In any case where valid mining claims or other valid occupancies are wholly within a designated forest wilderness area, the Secretary of Agriculture shall, by reasonable regulations consistent with the preservation of the area as wilderness, permit ingress and egress to such surrounding areas by means which have been or are being customarily enjoyed with respect to such other areas similarly situated."

The project is located in the Forest Plan Management Area 7c. The goals for Management Area 7c are to "manage in accordance with the Wilderness Act of 1964… to ensure an enduring system of high quality Wilderness…"

Direction for the management of the Wilderness portion of the affected area is contained in the Selway-Bitterroot Wilderness General Forest Plan Management Direction (Forest Plan Amendment #7, 1992) (PF G-10). This amendment established the following goals for the Selway-Bitterroot Wilderness.

- Preserve the integrity of the Selway-Bitterroot Wilderness resource to meet the purposes described in the Wilderness Act; to protect and preserve natural conditions so that the wilderness generally appears to have been affected primarily by the forces of nature, with the imprint of human work substantially unnoticeable, and has outstanding opportunities for solitude or primitive and unconfined recreation.
- Provide for limiting and distributing visitor use of specific portions in accordance with periodic estimates of the maximum levels of use that allow natural processes to operate freely and that do not impair the values for which wildernesses were created.
- Apply a Prevention of Significant Deterioration (PSD) approach to prevent a net degradation of the wilderness resource while acknowledging that wilderness, and the impacts caused therein, is dynamic.

The Bitterroot National Forest Plan notes in Amendment #7, page M-1 (PF G-10) that many special use dams exist in the Wilderness, that they need to be maintained to a safe condition, and may need mechanical access and motorized equipment to maintain at least some of them.

The Bitterroot National Forest Plan specifies in Amendment #7, Section II, M-2 (PF G-10): Environmental assessments or environmental statements will be prepared for all reconstruction and heavy maintenance work on reservoirs within the wilderness. These reports will include analysis of non-motorized vs. motorized means of doing work. Motorized equipment or other non-conforming activities will be authorized when it can be demonstrated that:

- It is the only feasible means of accomplishing the necessary maintenance.
- The continued existence of the reservoir is more in the public interest than it's breaching.

Feasibility for the use of primitive equipment will be based on the technical requirements of the project.

Section II, A-1 specifies: "The minimum tool principle will be applied to the management of all resources within the Selway Bitterroot Wilderness. This means that the minimum management actions necessary to correct a given problem will be identified. These will be implemented using the methods and equipment that accomplish the objective with the least impact on the physical, biological and social characteristics of wilderness."

A Minimum Requirements Decision Process was used to evaluate the minimum tool necessary to accomplish proposed work and methods of access. See Appendix X for Minimum Requirements Document.

Water Resources Forest Plan and Regulatory Consistency

Either alternative for the Mill Lake Dam 2005 project would be consistent with the 1987 Bitterroot Forest Plan Standards and Guidelines (listed in the Affected Environment – Water Resources Report), although the No-Action (Alternative 1) alternative would not accomplish the purpose and need. All other pertinent regulations pertinent to water resources would also be met, as long as proper permitting processes are followed.

Water Resources- Regulatory Framework

The Bitterroot National Forest Plan (USDA 1987) provides direction to protect and manage resources. Only direction pertaining to the water resources portion of the project is included here.

The Forest Plan forest-wide goal for soil and water resources is to:

- Maintain soil productivity, water quality, and water quantity (p. II-3).

Forest –wide Management Objectives state how resources will be managed under the Forest Plan:

- Manage riparian areas to prevent adverse effects on channel stability and fish habitat (p. II- 6).

Forest-wide Management Resource Standards provide further detail:

- Utilize equivalent road area or similar concept to evaluate cumulative effects of projects involving significant vegetation removal, prior to including them on implementation schedules. (p. II-23)
- Maintain the percentage of "hydrologically unrecovered" area permitted in a landscape within the guidelines of Table II-5 of the Forest Plan. (p. II-24)
- As part of project planning, site-specific water quality effects will be evaluated and control measures designed to ensure that the project would meet Forest water quality goals; projects that will not meet State water quality standards will be redesigned, rescheduled, or dropped. (p. II-24)
- Soil and water conservation practices will be a part of project design and implementation to ensure soil and water resource protection. (p. II-25)
- Actively reduce sediment from existing roads. Sediment reduction measures to be considered include:

  Cross-drains into vegetative filter strips away from streams,

  Grass seed, fertilized, mulch and netting on cuts and fills,

  Slash filter windrows or straw bales at toe of fill in contributing areas; and

  Gravel ditches and road surfaces (p. II-25)
- Protect and preserve the integrity of and maintain access to the snow survey sites and electronic SNOTEL sites shown in Table II-6 in the Forest Plan. (p. II-25)

- Road plans and environmental analysis reports for activities in the Sheafman Creek and Burnt Fork municipal watersheds will be submitted to the Montana Water Quality Bureau for review and approval. (p. II-26)

The following Management Areas have further Management Goals and Management Standards that pertain to water resources. (Forest-wide Goals and Standards apply to all.)

MA1, 2, 3a, 3c, 8a:

Management Standards:

- Utilize watershed rehabilitation projects such as stabilizing road cut or fill slope slumps to repair problems. (pp. III-6, 12, 18, 33, 59)

MA3b: Additional Management Area Goals:

- Manage riparian areas to maintain flora, fauna, water quality and water-related recreation activities. Emphasize water and soil protection. Roading in riparian areas will be restricted to meet water quality and fish objectives. (p. III-22)

Management Standards:

- Utilize watershed rehabilitation projects such as stabilizing road cut or fill slope slumps to repair problems. (p. III-27)

MA5: Management Standards:

- Management activities will be designed to protect the municipal watershed.
- Trail improvement or construction will be implemented with emphasis on soil stability and stream protection. (p. III-40)

MA8b: Management Standards:

- Habitat improvement practices will be designed to minimize or eliminate degradation of soil and water resources. (p. III-62)

Other regulatory or legal requirements that direct watershed management are:

- Section 208 of the 1972 amendments to the Federal Water Pollution Control Act (Public Law 92-500), which specifically mandates identification and control of nonpoint-source pollution resulting from silvicultural activities.
- Clean Water Act, Sections 303, 319, 404
- Section 303(d) directs states to list water quality impaired streams (WQLS) and develop total daily maximum loads to control the non-point source pollutant causing loss of beneficial uses. Up until late March 2001, agencies were instructed to use the 1996 Montana 303d list of Water Quality Impaired Streams. The Environmental Protection Agency (EPA) approved the 2000 Montana 303d list in late March 2001. Because the 2000 list was approved late in this analysis, and a 2000 court order to the state to complete TMDL's (water quality standards and restoration plans) for all streams on the 1996 list, both lists are referenced in this report. TMDLs have not yet been developed for Bitterroot National Forest streams. Section 319 directs states to develop programs to control non-point source pollution, and includes federal funding of assessment, planning and implementation phases. At this time, no known Section 319 projects would be detrimentally affected by project activities. Section 404 controls the dredge and fill of material in waterbodies of the U.S.; proposed excavation and construction activities for Mill Lake dam appear to need this federal permit.

- Section 403 of Title IV of the Agricultural Credit Act of 1978 (16 U.S.C. 2201-2205) and Title 7, Code of Federal Regulations, Part 624 (7 CFR 624), the Emergency Watershed Protection Program. The objective of these emergency watershed protection and conservation programs is to assist in relieving imminent hazards to life and property from floods and the products of erosion created by natural disasters that cause a sudden impairment of a watershed.
- ARM 16.20.603 – Best management practices (BMPs) are the foundation of water quality standards for the State of Montana. The Forest Service has agreed to follow BMPs in a Memorandum of Understanding with the State of Montana. Many BMPs are applied directly as mitigations for this proposal. Implementation and effectiveness monitoring for BMPs would be routinely conducted by contract administrators, and during other implementation and annual monitoring events.
- ARM 17.30 Sub-chapter 6 details water quality standards for the State of Montana. The USFS has primary responsibility to maintain these standards on lands under their jurisdiction in the State of Montana.

Designated Beneficial Uses of Local Waters

The Montana Department of Environmental Quality has given all National Forest waters its B-1 classification (ARM 16.20.604). The associated beneficial uses of B-1 waters are drinking, culinary and food processing purposes (after conventional treatment); bathing, swimming and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.

Water quality is currently maintained and improved through the application of Best Management Practices (BMPs) for controlling nonpoint sources of pollution to surface water. Use of BMPs is the foundation of water quality standards for the State of Montana. This is documented in ARM 16.20.603 and means “land and management activities must not generate pollutants in excess of those that are naturally occurring, regardless of the stream’s classification”. Naturally occurring as defined by ARM, is the water quality condition resulting from runoff or percolation over which man has no control or from developed lands where all ‘reasonable’ land, soil and where conservation practices (commonly called BMPs) have been applied. Effectiveness of these measures is rated through the State of Montana BMP audit process every other year on a mix of land ownerships where timber harvest has occurred. The results of these audits are published annually by the Department of Natural Resources and Conservation. In 2000, on Federal lands BMP application was rated as 96 percent compliant, and 97 percent effective.
The proposed action has the potential to affect the physical and biological quality of the waters within the project area. The associated water quality criteria that could be affected are:

2. No person may violate the following specific water quality standards for water classified B-1:

(d) The maximum allowable increase above naturally occurring turbidity is 5 nephelometric turbidity units except as permitted in ARM 16.20.633.

(e) A 1 degree F maximum increase above naturally occurring water temperature is allowed within the range of 32 to 66 degrees F;

(f) No increases are allowed above naturally occurring concentrations of sediment...which are likely to create a nuisance or render the waters harmful, detrimental, or injurious to public health, recreation, safety, welfare, livestock, wild animals, birds, fish or other wildlife (ARM 16.20.633).

Fisheries- Regulatory Consistency and Forest Plan Consistency

The proposal meets the Forest Plan standards and other regulatory direction. INFISH set standard widths for Riparian Habitat Conservation Areas (RHCAs). Within RHCAs, riparian-dependent resources, such as native fish habitat, receive primary emphasis. This project is within the Mill Creek RHCA. The INFISH Standards and guidelines most relevant to this project include:

LH-1 Require…habitat conditions for…surface water development proposals that maintain or restore riparian resources, favorable channel conditions, and fish passage reproduction and growth….

This proposal may temporarily degrade riparian resources below the Mill Lake Dam as a result of working in the stream channel. Work in the channel should result in less risk for dam failure, which improves the long-term stability of the channel and downstream fish habitat.

RA-4 Prohibit storage of fuels and other toxicants, and other chemicals within Riparian Habitat Conservation Areas. Prohibit refueling in RHCA unless there are no other alternatives. Refueling sites in the RHCA must be approved by the FS and have an approved spill containment plan.

Requirements for a spill plan will be incorporated in this project. Fuel will be stored more than 100 feet from the surface water. Due to the amounts to be used and the nature of the work, storage further away may be impractical. The storage area will be lined to contain spills or leaks.

A biological assessment (BA) that evaluates potential effects of the proposal on threatened bull trout (Salvelinus confluentus) and a biological evaluation (BE) to determine how an action or proposed action may affect the sensitive Westslope cutthroat trout (Oncorhynchus clarki lewisi) have been completed. A BA and BE require similar information and were combined into one document to provide a more comprehensive analysis (USDA Forest Service 2005b). Mitigation measure listed in the BE/BA would limit the potential impacts to the fisheries.

Wildlife- Regulatory Consistency and Forest Plan Consistency

The Forest Plan does not contain any goals, objectives or standards pertaining directly to mountain goats.

Regulatory Framework

The two principle laws relevant to wildlife management are the National Forest Management Act of 1976 (NFMA) and the Endangered Species Act of 1973 (ESA). Regulations promulgated subsequent to passing NFMA require the Forest Service to manage fish and wildlife habitat to maintain viable populations of all native and desirable non-native wildlife species and conservation of listed Threatened or Endangered species populations (36CFR219.19). Additional guidance is found in Forest Service Manual (FSM) Direction, which states; identify and prescribe measures to prevent adverse modifications or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species (FSM 2670.31 (6)). ESA requires Forests to manage for the recovery of threatened and endangered species and the ecosystems upon which they depend. Forests are required to consult with the Fish and Wildlife Service if a proposed activity may affect the population or habitat of a listed species.

The FSM also directs the Regional Forester to identify sensitive species for each National Forest where species viability may be a concern. Forests are then required to monitor sensitive species populations and prevent declines that might require listing under ESA (FSM 2670.32 (4)).

The principle policy document relevant to wildlife management is the Bitterroot Forest Plan of 1987. This document provides standards and guidelines for management of wildlife species and habitats on the Forest. The Record of Decision (1987) for this plan requires retention of 25 percent of the big game winter range in thermal cover. Other Forest Plan standards related to maintenance of wildlife populations include standards for amount and distribution of old growth habitat by management area, retention of snags, maintenance of elk populations and habitat, and management of elk habitat effectiveness through the Travel Planning process (USDA, Forest Service, 1987).

Threatened and Endangered and Sensitive Wildlife Species

All alternatives meet Forest Plan standards (FP II-21) and ESA requirements for the conservation of Threatened and Endangered wildlife species.

All alternatives meet Forest Plan standards (FP II-21) and FSM direction for management of sensitive wildlife species.

Management Indicator Species Consistency

Forest Plan Compliance

The Mill Creek Dam project does not include any timber management activities. Therefore, there is no Forest Plan direction to analyze elk habitat classifications in the Mill Creek drainage. No changes to existing elk habitat ratios are anticipated as a result of this project.

All alternatives meet Forest Plan standards for elk habitat and elk habitat effectiveness (FP II-21) because none would change the existing condition. The Forest Plan Record of Decision requires retention of 25% thermal cover in elk winter range. All alternatives are consistent with this requirement since none would alter existing thermal cover percentages.

Consistency with the Bitterroot Forest Plan

All alternatives meet Forest Plan standards for pine marten (FP II-19), since all retain existing old growth habitat.

All alternatives meet Forest Plan standards for pileated woodpeckers (FP II-19), since all retain existing old growth habitat.

Threatened, Endangered and Sensitive Plant Species- Regulatory Consistency and Forest Plan Consistency

The Endangered Species Act requires that the Forest Service conserve endangered and threatened species. The National Forest Management Act and Forest Service policy direct that National Forests be managed to maintain populations of all existing native plant and animal species at or above minimum population levels. A minimum viable population consists of the number of individuals adequately distributed throughout their range necessary to perpetuate the existence of the species in natural, genetically stable, self-sustaining populations. Plant species for which population viability is a concern are identified by the Forest Service as sensitive species. This category may include federal candidates (plants being studied by the U.S. Fish and Wildlife Service for proposed listing as threatened or endangered status), or plant species proposed for listing as threatened or endangered in the Federal Register (MNHP 2003). Forest Service policy requires that activities conducted on National Forest lands be reviewed for possible impacts on endangered, threatened or sensitive species (FSM 2670).

Three federally listed threatened plant species occur in Montana: water howellia (*Howellia aquatilis*), Spalding's catchfly (*Silene spaldingii*), and Ute ladies' tresses (*Spiranthes diluvialis*). None of these species have been found on the Bitterroot National Forest. The Northern Region Sensitive Plant Species List (USDA Forest Service 2004) identifies a number of plants for each National Forest for which population viability is a concern. This list includes 31 vascular and two non-vascular plant species on the Bitterroot National Forest.

Noxious Weeds Regulatory Consistency

Bitterroot National Forest Plan, 1987: page II-3 (9) Control noxious weeds to protect resource values and minimize adverse effects on adjacent private land. Mitigation measures for noxious weed prevention are intended to minimize adverse effects.

Federal Noxious Weed Control Act (PL-93-629): The Act provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health. Mitigation measures for noxious weed prevention comply with the intent of this Act.

Heritage Resources Regulatory Consistency

The primary legislation governing modern heritage resource management is the National Historic Preservation Act of 1966 (NHPA) (amended 1976, 1980, and 1992). All other heritage resource management laws support clarify or expand on NHPA. Specific Forest Service heritage resource management practices are based on Federal Regulations 36CFR800 (Protection of Historic Properties), 36CFR63 (Determination of Eligibility to the National Register of Historic Places), 36CFR296 (Protection of Archaeological Resources), and Forest Service Manual 2360 (FSM2360).

Other laws addressing various aspects of heritage resource management on the National Forests include the National Environmental Policy Act of 1969 (NEPA), the National Forest Management Act of 1976 (NFMA), the Antiquities Act of 1906, the Historic Sites Act of 1935, and the Archaeological Resource Protection Act of 1979 (amended 1988) (ARPA). Along with ARPA, two other regulatory acts, the Native American Graves Protection and Repatriation Act (NAGPRA) and the American Indian Religious Freedom Act of 1978 (AIRFA), define the role of Tribes in federal heritage resource management. The National Historic Preservation Act also specifically requires Tribal participation in the consultation process.

The Bitterroot Forest Plan tiers to these laws and regulations, as do Forest-wide Management Standards calling for the preservation of significant Heritage resources in place wherever possible, cultural resource inventory for most ground-disturbing activities, and consultation with tribal religious leaders on spiritual sites.

The Confederated Salish and Kootenai Tribes of the Flathead Reservation regard the entire Bitterroot National Forest as an area of cultural concern. The tribes exercise treaty rights on the Forest under the 1855 Hellgate Treaty, and are consulted on all Forest undertakings. Consultation with the Tribes regarding this project occurred on May 12, 2004, with no cultural concerns identified.

Air Quality – Regulatory Consistency

The Clean Air Act

The basic framework for controlling air pollutant in the United States is mandated by the 1970 Clean Air Act (CAA), as amended in 1977 and 1990 and (42 U.S.C. §7401 et seq.). In 1999 minor changes were made to the CAA for visibility in section 7491 and 7492.

These changes were published on July 1, 1999, as the Regional Haze Rules (64 FR 35714). The CAA was designed to protect and enhance the quality of the Nation's air resources. The Act encourages reasonable Federal, State and local government actions for pollution prevention. State Implementation Plans (SIPs) are developed by each state to implement the provisions of the Clean Air Act. The SIPs describe the actions the State will take to achieve and maintain the "national ambient air quality standards" (NAAQS).

Because there would be no effects to air quality within the Class I area (Selway-Bitterroot Wilderness) as a result of this project, the proposed action complies with the Clean Air Act.

AGENCIES AND PERSONS CONSULTED

The Forest Service consulted the following individuals, Federal, State, and local agencies, Tribes and non-Forest Service persons during the development of this environmental assessment:

INTERDISCIPLINARY TEAM MEMBERS

Elizabeth Ballard – Interdisciplinary Team Leader
Pete Zimmerman – NEPA/NFMA
Terri Anderson – Engineering
Debra Gale – Wilderness
Lori Clark – Air Quality
Linda Pietarinen – Botanist
Dave Lockman – Wildlife
Rob Brassfield – Fisheries
Ed Snook – Hydrology
Mary Williams – Heritage Resources
Lynne Dickman - Soils

FEDERAL, STATE, AND LOCAL AGENCIES:
Montana State Historic Preservation Officer (2005 Compliance Report)
The Confederated Salish and Kootenai Tribes of the Flathead Reservation (May 2004)
Native American Tribal members were consulted as required by the National Historic Preservation Act, the National Environmental Policy Act, and the American Indian Religious Freedom Act.

OTHERS:
Steve Romero, Region 1 Geotechnical and Dams Safety Engineer
Michael Oelrich, Hydrometrics Inc., Engineer
Laurence Siroky, State of Montana Dam Safety Program, Engineer
Mack Long, Montana Fish Wildlife and Parks

Appendix A

Authority to Regulate Safety of Dams on National Forest System Lands

The authorities through which the U.S. Forest Service regulates safety of dams on National Forest lands are as follows:

National Dam Safety and Security Act of 2002 (P.L. 107-310)
National Dam Safety Program Act of 1996 (P.L. 104-303)
FSM 7500 Forest Service Engineering Requirements for Water Storage and Transmission Projects, August 1993
FSH 7509.11 Forest Service Dams Management Handbook, August 1993
Water Resources Development Act of 1992 (33 US.C. 2201)
Presidential Memorandum of October 1979 and Federal Guidelines for Dam Safety, pub. June 1979, reprinted by FEMA April 2004.
Federal Dam Inspection Act of 1972 (P.L. 92-367)
Departmental Regulations 1043-18 (USDA)
Title 36, Code of Federal Regulations, Part 251 and FSM 2700
Title 18, Code of Federal Regulations, Part 4
Title 33, Code of Federal Regulations, Part 208

Memorandum of Understanding between the State of Montana, Department of Natural Resources and Conservation, and USDA Forest Service, Northern Region, Mar. 2000

Responsibility for Dam Safety

Mill Creek Irrigation District, through their engineering representative, is responsible for the design, plans and specifications for this project. The Forest Service is responsible for ensuring compliance with current dam safety laws and regulations on National Forest System Lands. Both parties have the responsibility to protect public safety and the environment from an unacceptable risk of catastrophic failure.

After Teton Dam failed in 1976, the direction for dam safety programs changed through an executive order, signed by President Carter that directed Federal agencies to implement the Federal Guidelines for Dam safety (reprinted April 2004), FEMA Publication No. 93, prepared by the Interagency Committee on Dam Safety (ICODS). (PF G-1) The objective is clearly stated under section I.A. Background: "It is the intent of these guidelines to outline management practices that will help to ensure the use of the best current technology in the design, construction and operation of new dams and in the safety evaluation of existing dams." In Section II. Objectives and Scope: "Those charged with administering these guidelines must recognize that the achievement of dam safety is through a continuous, dynamic process in which guidelines, practices, and procedures are examined periodically and updated. Technical procedures need to change with technological advancement, and management should ensure that observed deficient practices are corrected and that successful practices are duplicated."

Appendix B

Condition of Mill Lake Dam and Proposed Repairs

Condition of Mill Lake Dam

Mill Lake Dam is an aging high hazard dam in need of rehabilitation. The low level outlet for Mill Lake Dam is a 24-inch diameter, 92-foot long corrugated metal pipe (CMP). A 24-inch square cast iron slide gate and 36-inch diameter corrugated steel riser is located in the center of the dam embankment. The corrugated metal pipe and control gate is estimated to be over 50 years old, which is well past the normal expected service life - particularly in the acidic environment (pH of the lake water measured 4.5). Severe corrosion and large holes in the bottom of the outlet pipe were discovered during an inspection completed by DJ Engineering, PLLC in September 2000, and during temporary repairs in October 2001. The primary concern related to this deficiency is the potential for piping, or internal erosion, of the embankment materials around the outlet pipe - which can result in a dam failure. Piping and seepage is one of the leading causes of failure for embankment or earthfill dams.

Temporary repairs were made during October 2001 and September 2002 to reduce excessive seepage flows exiting the downstream toe adjacent and left of the outlet conduit. A geophysical survey (2001) indicated that high conductivity zones next to the conduit and areas near the upstream vicinity of the outlet pipe. In October 2001, the suspected areas for potential piping channels were repaired with bentonite and a 20 ml HDPE geomembrane on the upstream face of the dam around the outlet pipe. After the intake structure was dewatered and the trashrack was removed for the repairs, extensive corrosion was noted in the bottom section of the 24-inch corrugated metal outlet pipe. The corrosion failure extended at least 6 feet downstream of the entrance to the pipe, and other locations including 38 and 42 feet downstream of the inlet.

Based on the discovery of more extensive deterioration of the outlet pipe during emergency repairs in 2001, additional repairs were completed in September 2002. A 70-foot long flexible liner (extending from the conduit inlet to the gate chamber) was installed inside the existing outlet pipe to prevent seepage and potential piping through and alongside the outlet pipe. The liner consists of a 30 mil thick watertight geomembrane backed by a geotextile fabric to protect it from sharp edges and surface of the conduit. The flexible liner is held in place against the existing outlet pipe with internal CMP expansion bands. DJ Engineering successfully installed the temporary liner, but advised the irrigation district that this was a temporary measure, and that a more permanent repair should be pursued: *"The planned temporary repairs are not expected to stop the vast majority of water entering the piping channels within the embankment. If excessive seepage occurs next spring, the next repair step would be to pressure grout the exterior of the conduit."* (ref. *"Construction Report on Repairs to Mill Lake Dam, Sept 2002",* DJ Engineering, PLLC, Dec. 2002) The liner was a temporary measure to prevent internal erosion – not a permanent, long-term repair for addressing this problem.

The Forest Service required an Early Warning System and updated Emergency Action Plan because of the temporary nature of the repairs. The Early Warning System was installed in September 2002 to provide warning time to downstream residences at risk in the event of dam failure. A table-top exercise was completed with state and local officials in May 2002 for emergency preparedness. An updated Emergency Action Plan with current contacts and emergency procedures is required on a routine basis.

MCID's Proposed Repairs on Mill Lake Dam

Mill Creek Irrigation District proposes to correct the deficiency and proceed with a permanent repair to the Mill Lake Dam outlet. Slip-lining of the corroded metal pipe is planned after the reservoir level is drawn down, around early August of 2005. A small cofferdam around the outlet may need to be installed, depending on the reservoir level and precipitation prior to and during the project.

The slip-lining project is planned to include the following work:

1. Removing the temporary flexible liner in the existing outlet pipe, removing existing intake structure, removing concrete headwall on the downstream side of the outlet pipe.
2. Slip-lining the old 24-inch diameter corrugated metal pipe with a new 20-inch (o.d.) high-density polyethylene pipe (refer to Appendix C for a discussion of why PVC pipe is not appropriate for this project). This will most likely be accomplished using a hand-cranked winch to pull the new pipe through the existing outlet pipe.
3. Grouting the annulus between the old and new pipe, and grouting the voids around the old gate chamber located in the mid-section of the dam. Approximately 14 yards of grout would be used (Minimum Requirements Worksheet, Appendix F).
4. Removing the existing 24-inch square slide gate.
5. Installing a new 20-inch gate valve and housing, gate stem and operator on the downstream side of the embankment.
6. Installing a 4-foot diameter corrugated HDPE tee and pipe downstream of the new gate for improved access and ability to maintain the gate.

The decision has been made by Mill Creek Irrigation District, through their engineering representative, to utilize state-of-practice techniques to prepare and deliver the grout to the dam site to maintain tight control on the grout mixes and meet design specifications. Batching the grout mix at a local batch plant, then transferring it to the dam site by helicopter eliminates many variables that would reduce the uniformity and consistency of the grout. The materials used for grouting have been selected based on increased strength, extended workability or setting time, low shrinkage, reduced permeability with time, high resistance to chemical attack and improved pumpability. The improved quality and durability of the proposed grouting process benefits the public through a longer lasting and more reliable repair. This would be difficult, if not impossible, to accomplish using primitive methods.

Some exploratory work around the outlet pipe is expected to be accomplished with minimum tools (picks and shovels) to determine the condition of the material within the first 15 feet from the toe of the dam at the outlet.

The existing gate location for the outlet control works is located in the center of the dam. The new location for the gate valve will be located on the downstream side of the embankment near the interface between the fine materials within the dam and the new rock buttress. The proposed design will include a 4-foot diameter corrugated HDPE pipe below the headgate, the purpose of which is to provide improved accessibility and more long-term reliability affecting the operation and maintenance of the headgate.
A similar design was successfully implemented at Canyon Lake Dam. This improved design protects the slide gate and gate stem from debris, ice, and vandalism, which improves the efficiency of and maintainability to the headgate. This results in additional benefit by reducing the frequency of repairs necessary to maintain the operator and headgate. Accessibility to the gate also improves the ability to inspect the headgate.

The expected length of operations is an estimated 3 to 4 weeks. Helicopter use would last approximately five days, which includes an estimated 25 to 30 helicopter trips. Approximately four stock trips of six horses each time would be necessary (Refer to Appendix F for Minimum Requirements Worksheet).

Appendix C

Background Information - Alternatives Considered but not Studied in Detail

Alternative 3- Packing in Grout, Onsite Mixing of Grout, and Helicopter Transport of Equipment that cannot be Packed in with Stock

This alternative considers onsite batching and mixing of the grout, which has been determined to be unacceptable for this high hazard dam based on the design engineer's recommendation. (Refer to Letter from Mike Oelrich, Hydrometrics, Inc.(PF B-13).

Grout typically consists of cement, fine aggregate or sand, potable water, and admixtures. Correct proportioning or batching is required to achieve the required consistency and characteristics for slip-lining. In order to meet specifications, the amount of water must be carefully monitored and controlled, and the gradation of the aggregate or sand must be within specific tolerances. A controlled batching facility provides calibrated and certified scales resulting in more accurate mix proportions. It also provides the ability to thoroughly mix the ingredients and adjust to changing conditions, if necessary. Segregation of the grout would not be accepted. In addition, it is important to maintain a continuous supply of grout once the pressure grouting operations begin. Batching and mixing operations for the grout mix at the required rates - without degradation due to set time limitations - would be very difficult to achieve with primitive methods.

Approximately 14 cubic yards of grout will be needed to seal the annular space between the existing 24-inch diameter corrugated metal pipe and the new 20-inch diameter HDPE insert pipe. Voids around the existing pipe and the old gate chamber will also be sealed with grout. Some voids will likely be filled outside the existing deteriorated 24-inch diameter corrugated metal pipe because of the holes that were discovered during an earlier inspection (DJ Engineering, Sept. 2000). (The corrugated metal pipe was lined with a temporary liner to prevent a potential piping problem). It is unacceptable to leave a void between the severely corroded metal pipe and the new pipe. The deteriorated pipe would continue to corrode, and the soil could collapse in to fill the void – which could result in a piping failure of the dam.

Utilizing onsite materials, including material from the reservoir bed for the sand or fine aggregate portion of the mix, and use of reservoir water also presents other problems:

1. Onsite materials do not provide consistency (for example: out-of-spec gradation, variable densities), which introduces non-uniformity to the mix. This leads to other problems in the grouting operations, such a mix which is too stiff or too dense, which affects the ability to pump through the tremie tubes and adequately seal the annular space.

2. Onsite materials introduce the potential of contamination from unwanted deleterious materials, such as woody debris, to the grout mix.

3. Onsite materials vary in water content – this presents extreme difficulties when batching the mix ratios according to specifications.

4. Water from the reservoir/creek is too acidic for achieving an optimum grout mix.

If the grout fails to seal the annular space, seepage flow can occur within the voids around the pipe. Seepage around the outlet conduit can result in the movement of embankment materials and "backward" erosion from the downstream to the upstream side of the dam. This backwards erosion, or piping, can ultimately fail the dam. Piping (particularly around the outlet works) is one of the leading causes of dam failure for earth embankments. Based on these potential risks and unacceptable engineering practices, Alternative 3 was eliminated from further consideration.

The materials to make up the grout weigh approximately 3000 lbs. per cubic yard. Based on the estimated quantity of 13.5 cubic yards to slip-line the pipe (Hydrometrics, Inc.), the total weight that would have to be packed in is approximately 40,500 lbs. of materials to make up the grout, not including the grout pump, agitator and tank required to batch and pump the grout. At 150 lbs per round-trip mule load with each stock train consisting of 1 horse with rider and 5 pack animals the number of trips for the grout materials, camping supplies, personnel, misc. tool's, equipment and demobilization of the worker's camps could easily reach 60-70 round-trips to the dam. Each round trip is approximately 23 miles from the Mill Creek trailhead to the dam site and return.

Refer to Appendixes E and F for additional information.

Alternative 4 – Non-Mechanized/Non-Motorized

This alternative would not meet state of practice techniques for design and construction methods which would jeopardize the long-term performance of the dam and potentially threaten public safety.

This alternative not only presents the same dam safety considerations as alternative 3, but it also adds other complications. Both alternatives 3 and 4 describe the infeasibility for onsite batching and mixing of the components of the grout (cement, sand or fine aggregate, water, admixtures, etc.).

Alternative 4 not only reduces the quality of the grout by utilizing less accurate and less efficient mixing and batching operations, but also presents impossible logistical problems, such as packing the 20-inch diameter, 92-foot long high density polyethylene pipe, (weighing approximately 2300 lbs.) the grout pump, agitator and tank by stock. Alternatives 5 and 6 (below) discuss breaking down the pipe into packable sections.

Refer to Appendixes E and F for additional information.

Alternative 5 – Fusion Welding Equipment (HDPE Pipe)

A fusion welding machine could be utilized to weld sections of HDPE pipe, and shorter sections of pipe could be hauled in by pack stock. However, fusion welding equipment, capable of welding 20-inch diameter HDPE pipe, weighs approximately 3800 lbs (not including the power source or generator). Use of this equipment requires a medium lift helicopter. Compared to the overall number of helicopter trips and impacts to Wilderness, this option does not present any advantage, and it adds another potential unknown variable in the integrity of the pipe - welded connections compared to a single joint of pipe. This option was eliminated from further consideration because it adds additional costs for the fusion welding machine and it does not provide any advantages from a Wilderness impacts perspective.

Refer to Appendixes E and F for additional information.

Alternative 6 - Suitability of Alternative Piping Materials (PVC and Snap-Tite® HDPE)

The use of PVC pipe for the slip-lining application in Mill Lake Dam could seriously compromise the structure of the dam. Other piping materials, including Snap-Tite ® HDPE pipe has also been evaluated, based on input received during the public comment process.

This alternative would not meet state of practice techniques for design and construction methods which would jeopardize the long-term performance of the dam and potentially threaten public safety.

Refer to Appendixes E and F for additional information.

Suitability of PVC Pipe for the Outlet Works at Mill Lake Dam

This summary will explain why the use of PVC pipe for the outlet works was appropriate for Holloway Dam, and why it is not appropriate for the majority of dams, particularly high hazard dams comprised primarily of gravely sands and silty sands within the embankment, such as Mill Lake Dam.

Holloway Dam is a low hazard dam, and the use of PVC pipe for the outlet works was a very unique situation to address Wilderness concerns – but not at the expense of public safety. During the original construction of Holloway Dam, the outlet works was constructed by blasting a long, narrow trench through the natural bedrock along the lake rim. The outlet pipe and control gate was placed in the bottom of this trench, and the trench was filled in with stacked rock above the pipe. This stacked rock embankment continues above the trench, and the rock embankment widens out along the natural lake rim. The lower elevation of the trench and outlet works allows the reservoir to be drawn down below the natural outlet of the lake. This unique design provides additional irrigation water later in the season by drawing from the lower portion of the reservoir.

During the field season of 2001, the existing 20-inch diameter steel outlet pipe (located in the blasted trench bottom) was slip-lined with a 15-inch diameter PVC outlet pipe. The existing steel pipe was corroded and the dam owners proposed slip-lining with either PVC or ductile iron pipe. In most cases, the use of PVC is not an acceptable material for this application. However, the rock embankment at Holloway Dam does not present the risk of piping failure at a joint connection with PVC pipe in the outlet works – because the dam is composed of stacked rubble rock – not fine sandy silty materials that can be transported by seepage at a leaking pipe joint.

According to the State of Montana Dam Safety Program:

> *"PVC pipe has been used with success on very small, low-head dams. The advantage to using PVC is its availability and cost. However, PVC is joined using a bell and spigot with a gasket. This type of joint can easily leak because of normal settlement of dam fill. Thus, it should only be used on small dams where settlement is not a concern."*

This information regarding the use of PVC for outlet works is provided from an excellent reference, written in layman's terms, entitled "*Small Earthen Dam Construction, A Guidebook for Planning and Construction of Small Earthen Embankments"*, Montana Department of Natural Resource and Conservation, Water Resources Division, Dam Safety Program, September 2004.

Another reason that PVC pipe is not used for the outlet works in embankment dams is that the material becomes brittle in colder temperatures, and the pipe is then susceptible to fracturing, particularly under changing load conditions or a "point load" - such as a rock. After much debate and consideration with respect to dam safety, the use of PVC pipe was approved for Holloway Dam – only because the use of the material did not compromise the integrity of the structure. If the PVC joints fail in the Holloway Dam outlet, and water leaks from the pipe interior to the outside of the pipe into the dam embankment, it does not present a serious threat to the integrity of the structure – because it is constructed from rock – not fine grained materials susceptible to piping. Seepage or leakage in a rock embankment does not even remotely present the safety problems as compared to an earth embankment constructed from materials such as silty sands, which are vulnerable to piping and internal erosion.

After his dam inspection in 2002, David Jones, consulting engineer for the Sweeney Creek Water Users Assn., concluded:

> "*If the steel pipe should corrode to the degree that the surrounding concrete encasement cracks and slows point (concentrated) loads against the PVC pipe, the pipe would be damaged over an extended period. This may be unlikely as the stacked embankment rock could bridge over the encasement."*

In the case of Mill Lake Dam, the use of PVC pipe for the slip-lining application is totally inappropriate and could seriously compromise the structure of the dam. The embankment at Mill Lake Dam consists primarily of sandy and silty materials – which are susceptible to piping and liquefaction under saturated conditions. If 4 to 6-foot long joints of PVC were utilized, each of these connections presents a weak joint within the 92-foot long outlet pipe at Mill Lake Dam. During slip-lining, the grout could shift the pipe and weaken the integrity of the bell and spigot joints. If a connection fails under the full reservoir pressure head, water could leak from the annular space through the corroded pipe into the embankment. This seepage, or leakage, into the embankment can then lead to internal erosion and the possibility of dam failure.

The other important factor relates to the hazard classification. Holloway Dam is classified as a low hazard dam and Mill Lake Dam is classified as a high hazard dam. High hazard dams are regulated under more stringent design criteria because of their hazard potential in the event of failure. The primary concern is a risk of loss of human life in the event of failure of a high hazard dam.

In conclusion, it is not appropriate to compare Holloway Dam with Mill Lake Dam, and PVC is not an appropriate outlet pipe material, particularly for an earth embankment such as Mill Dam. More importantly, Mill Lake Dam is classified as high hazard, and Holloway Dam is low hazard. This difference in hazard ratings presents a significant difference in the degree of tolerance for diverging from accepted engineering standards in design and construction.

Suitability of Snap-Tite® HDPE pipe for the outlet works at Mill Lake Dam

Because the use of this pipe system is not considered state of practice for this application, Steve Romero, Regional Getotechnical and Dams Safety Engineer, contacted the manufacturer of the Snap-Tite® pipe system (ISCO Industries) and asked for a warranty for its use in the proposed slip-lining application. The manufacturer has not provided a warranty for the Snap-Tite® system under the various pressures and loading conditions that the joints could be subjected to within the dam embankment.

There are several problems that could develop by using these mechanical joints for this service. The problems include uneven settlement in the dam or foundation, and the response of embankment materials under seismic loading. In addition, the Snap-Tite® design manual states that “the placement of a joint where the existing culvert bends or deflects, or where the joint is otherwise stressed also increases the chance of leakage”. The Snap-Tite® system of joints is also questionable when subjected to internal and external hydraulic pressures under a full reservoir head. We have been unable to find verifiable performance data available for this application.

The bottom line is that each mechanical connection, or joint, in the Snap-Tite® system introduces a potential failure probability in the reliability calculation of the piping system. Ultimately, this situation substantially increases the uncertainty associated with the long-term performance of the system under a variety of loading conditions that could

be experienced in the dam. It may also be difficult to maintain the integrity of the joints during both the slip-lining and grouting operations. This design change saves only one helicopter trip. It is not reasonable to eliminate one helicopter trip, which has a short-term temporal effect on wilderness, at the expense of introducing unnecessary potential risks related to the long term performance of a high hazard dam.

Alternative 7 - Cut and Cover, or Partial Breach to Replace Outlet Pipe

Another option that was considered and eliminated is the "cut and cover" method of replacing the outlet works pipe. This option requires removal of all the material above the existing pipe to be excavated (to a safe, stable slope for working conditions), remove the old pipe and replace with a new one, then replace the embankment materials back over the pipe in compacted lifts. Based on the more complex logistics for a "cut and cover" option - including the amount of time that the structure would be in a "non-use" status, the additional expenses to the irrigation district, and the additional impacts to Wilderness resources (particularly if the back-up plan utilizing earth-moving equipment and the mobilization of medium-lift helicopters), this option was eliminated from further consideration.

This method would require much more time, labor, and impacts to wilderness as compared to slip-lining the existing outlet pipe. In the *"Montana Renewable Resource Grant and Loan Program Application for the Mill Lake Rehabilitation,"* (PF# G-11) prepared by Hydrometrics Inc., slip-lining was the preferred alternative because of the significant amount of excavation (1700 cubic yards) necessary to replace the existing outlet pipe. The existing pipe would be removed and replaced with a new outlet pipe, which requires appropriate bedding material, compacted to acceptable density requirements around the pipe. A small hand-held vibratory compactor would most likely be used to compact directly next to the pipe.

After the pipe is installed, the embankment would be re-built to the dam crest in 6 to 8 inch lifts, compacted to acceptable density requirements with modern mechanized compaction equipment. A larger vibratory drum compactor would most likely be utilized to meet the required compaction densities within the limited timeframe. This larger compactor requires a medium lift helicopter for transport to and from the site.

To accomplish the "cut and cover" work during the next field season would be pushing the timeframe limits at this high elevation site before winter conditions begin. Based on the production rates for the Canyon Dam breach and outlet works replacement in summers 2003 and 2004, the same work at Mill Lake Dam would require two full field seasons to accomplish the work (compare 350 cubic yards Canyon Dam to 1700 cubic yards Mill Dam). The proposed action, or slip-lining, is expected to be implemented in an estimated three to four weeks.

If work fell behind schedule at this remote site, a backup plan would also be required to prevent the possibility of the dam being left in an exposed, vulnerable state through the following winter and spring runoff season. From a dam safety perspective, it is not acceptable to start excavation into an embankment and leave the exposed side slopes

susceptible to erosion during the following spring snowmelt and runoff season. The notch, or partial breach, would basically function as a spillway. Spillways for high hazard dams must be designed and constructed to specific criteria, including sizing criteria for the appropriate flood, as well as adequate armoring of the side slopes.

The back-up plan would include helicopter access to carry small earth-moving equipment (such as a Bobcat 753) to facilitate the earth moving operations during the limited time constraints. This equipment would be mobilized in addition to the required compaction equipment described earlier in this section.

Alternative 8 – Permanent Breach of Mill Lake Dam

Mill Lake Dam is authorized through an easement established by the Act of 1866. As long as valid land use occupancies and water rights exist, the right to maintain and reconstruct these facilities to applicable standards shall be allowed. This option is outside the scope of the decision space of the Forest Service, and the direction for administering easements recognized under the Act of 1866 has been included in Appendix D.

Appendix D

FSM 5500 LANDOWNERSHIP TITLE MANAGEMENT

Ensure consistent and equitable administration of outstanding grants and easements.

5522.1 - Grants for Water Conveyance Facilities

The direction in this section applies to all water conveyance system grants now administered by the Secretary of Agriculture, which were previously authorized and administered by the Secretary of the Interior, including those granted by the Act of July 26, 1866. Additional guidance is found in sections 5522.11 - 5522.13 and in FSH 5509.11, Chapter 60.

1. Administer valid existing easements, which have been shown to exist prior to October 21, 1976, according to the public land law under which the grant was made. The grant is not diminished by defects in a survey or description made many years ago.

2. Administer easements according to the rights conferred under the grant, and Department of Interior regulations at 43 CFR Part 2800, unless otherwise ordered by a court of competent authority. Grants authorize occupancy for particular purposes, and provide for use of the area actually occupied and used, or described in the easement or statute.

3. Allow use of a road when part of an existing right-of-way if it is adjacent to the system and was constructed as part of the system.

4. Allow a holder to perform maintenance and minor improvements within the easement right-of-way. A new authorization is not needed for normal maintenance or minor changes made in the facilities on the right-of-way to maintain capacity of the ditch as it existed on October 21, 1976. Significant changes in location or alignment, significant increases in the area occupied, construction of new access roads, and enlargements and extensions that increase capacity of the system or include new land will require application for, and issuance of, an authorization under FLPMA, as amended.

5. Allow a holder access to the easement on existing roads.

6. Ensure that water conveyance systems on National Forest System lands are operated in a manner that will protect the adjacent Federal lands from damage. Inspect the facilities to identify instances where damage is occurring or is likely to occur and make every attempt to obtain correction by the easement holder. If the holder does not make corrections, consult with the local Office of General Counsel (OGC) about appropriate legal remedies.

7. Although prior authorization is not required for holders to use mineral and vegetative materials, including timber, from National Forest lands for emergency repair work, ensure the holder makes prompt application for the materials used and appropriate

payment for such materials after the emergency has been resolved. Use of materials, on or off the right of way, for purposes other than emergency repair work requires application for, and issuance of, the appropriate permit, and payment in advance for the materials to be used.

5522.11 - 1866 Act Rights-of-Way

Policy in this section applies to rights-of-way for ditches and canals constructed under provisions of section 9 of the Act of July 26, 1866 (14 Stat. 253, 30 U.S.C. 51; 43 U.S.C. 661; sec. 2339, Revised Statutes). General policies in section 5522.1 also apply to these grants.

Rights-of-ways obtained under the 1866 Act were not formally documented and must be individually verified through water decrees, permits, water use records, deeds, ditch location statements, field survey notes filed with the Bureau of Land Management, water rights applications, testimony, court decrees, water administrative records, irrigation records, ditch rider notes, or other historical data. These rights-of-way, when verified, are a valid use of National Forest System land despite the absence of an authorizing document, and the Forest Service has recognized the existence of many such rights-of-ways since the National Forests were established.

1. Administer valid easements in accordance with the above 1866 Act and the various court decisions dealing with facilities constructed under that statute.

2. Treat questions relating to the rights of the United States or the water system owner as a title claim (see FSM 5510). Claims for damages to National Forest System land resulting from the use of the systems will be treated and processed the same as other claims. Work with the owner to ensure maintenance of improvements to prevent or stop damage. Consult the OGC before initiating action to recover damages.

3. Easements are an outstanding property right and are permanent until relinquished or abandoned.

4. Refer questions of abandonment to the Office of General Counsel (OGC) for advice.

Appendix E

Discussion Regarding Use of Primitive Techniques in Critical Elements of Mill Lake Dam

The dam safety profession has evolved beyond trial and error techniques that were utilized around the turn of the last century, and there are practices for slip-lining applications that are much more predictable. Although research and development still continues to improve the design, construction, repair, operation and maintenance of water storage structures, the final decision related to the design still remains with the dam owners and their engineering representative. They are the responsible parties who must be willing to take on the additional liability for potential consequences associated with unproven technology or questionable construction methods, particularly those critical elements affecting the long term structural stability and safe operation of the dam. Dam design must also be an integrated design that takes into account the interaction of the various components of the structure.

Dam safety is achieved by correcting known dam safety deficiencies according to accepted state-of-practice engineering standards in design and construction techniques. Some traditional techniques used to construct or repair these dams in the early 1900's have applications today as was demonstrated on Canyon Lake Dam during the rehabilitation in 2003 and 2004. However, the work accomplished on Canyon Lake Dam using primitive techniques involved the movement of materials exclusively. Primitive techniques were never utilized in the construction of critical elements of the dam, which included the following:

1. Compaction of soils to a required, verifiable and consistent density.
2. Construction and installation of highly reliable mechanical elements.
3. Batching or placement of high quality concrete or grout that meets the design specifications.

Prior to the 1920's, dam design was more trial-and error with little involvement by trained engineers, the consequence of which was a large number of dam failures. Even today, with updated analysis and investigation techniques, materials engineering and quality control, improved construction methods, and lessons learned from dam failure case histories, dam construction and rehabilitation is a relatively high risk endeavor with many pitfalls, including hydrologic, geologic and geotechnical. Technical requirements, guidelines, and engineering standards related to these subject areas affecting dam safety have been published by the US Bureau of Reclamation, US Corps of Engineers, US Natural Resources and Conservation Service, Federal Emergency Management Agency (FEMA), National Dam Safety Review Board, Interagency Committee on Dam Safety (ICODS), Association of State Dam Safety Officials (ASDSO), etc. (PF- G12).

In regards to dams in wilderness, the access issue prohibits importation of large quantities of high quality fill materials for use in the construction of the dam, considerably lowering the reliability of the dam. Given this shortfall, the reliability of various components of the dam must be maximized if the opportunity exists. In the end, reconstructing a dam using highly reliable techniques minimizes impacts to wilderness and the dam owners by minimizing the number of major repairs required to stabilize the dam. This, in turn, minimizes the number of trips required to conduct the repairs over the projected life of the reconstruction.

As an example, if an unsuitable piping material was used in an experimental project in the Mill Lake Dam repairs, the first obstacle to overcome is the actual slip-lining and grouting operations. If the mechanical connections get hung up, or pull apart while slip-lining the existing the corrugated metal pipe, problems could develop with the short timeframe to accomplish the work. It may then be necessary to mobilize another helicopter to transport additional piping materials to accomplish the work – but this time, the project schedule would be severely impacted. Scrambling around at the last minute trying to accomplish the work before winter in unacceptable temperatures for grouting operations and extreme working conditions leads to other problems. These circumstances could easily lead to a rushed project, and this situation typically leads to inferior workmanship, which affects the durability and quality of the final slip-lining project. Ultimately, this could lead to an emergency situation and another repair – the results are increased costs to the irrigation district, greater risks to public safety, and additional impacts to wilderness values.

Appendix F. Minimum Requirements Worksheets

Introduction

A legal notice soliciting comments on the proposed Mill lake Dam project was published in the Ravalli Republic on March 21, 2005, marking the beginning of the 30 day comment period pursuant to 36 CFR 215. All comments were evaluated and considered, and substantive comments relevant to environmental concerns were incorporated or addressed through project design or mitigation or otherwise in this minimum requirements worksheet and the environmental assessment.

The Mill Creek Irrigation District (MCID) has requested use of mechanized transport (helicopter) for work on Mill Lake Dam in 2005. The proponent's goal is to "rehabilitate the 98 year old high hazard dam for compliance with dam safety requirements, for retaining full storage water rights and to insure efficient releases".

The MCID's proposed work includes:

- Remove the temporary flexible liner in the existing outlet pipe.
- Slip-line existing 24-inch corrugated metal pipe with a 21½ inch O.D. (outside diameter) high density polyethylene pipe (HDPE).
- Grout annular space between new insert pipe and the existing 24-inch Corrugated Metal Pipe. Grout voids around the old gate chamber located in the mid-section of the dam.
- Install a new outlet gate and hydraulic value operator. The existing 24-inch square slide gate will be removed.
- Construct a new outlet structure.

The MCID is requesting the use of helicopters to transport heavy equipment, people, supplies and materials. They propose to use various types of specialized equipment including a grout pump, holding tank, and agitator.

Forest Service Manual, 2326.1 – Conditions Under Which Use May Be Approved. Allow the use of motorized equipment or mechanical transport only for:

- Emergencies where the situation involves an inescapable urgency and temporary need for speed beyond that available by primitive means. Categories include fire suppression, health and safety, law enforcement involving serious crime or fugitive pursuit, removal of deceased persons, and aircraft accident investigations.
- Aircraft or motor boat use established before the area was designated as wilderness by the Act of 1964 or subsequent wilderness legislation.
- Exploration and development of valid existing mineral rights (FSM 2323.7).
- Access to surrounded State and private lands and valid occupancies (FSM 2326.13).
- To meet minimum needs for protection and administration of the area as wilderness, only as follows:
    a. A delivery or application problem necessary to meet wilderness objectives cannot be resolved within reason through the use of non-motorized methods.
    b. An essential activity is impossible to accomplish by non-motorized means because of such factors as time or season limitations, safety, or other material restrictions.
    c. A necessary and continuing program was established around the use of motorized equipment before the unit became a part of the National Wilderness Preservation System, and the continued use of motorized equipment is essential to continuation of the program.
    d. Removal or aircraft wreckage when non-motorized methods are unsuitable.

36 CFR 293.13 provides specific direction for access to valid occupancies as follows: Persons with valid occupancies wholly within National Forest Wilderness shall be permitted access to such surrounded occupancies by means consistent with the preservation of National Forest Wilderness which have been or are being customarily used with respect to other such occupancies surrounded by National Forest Wilderness. The Forest Service will, when appropriate, issue permits which shall prescribe the routes of travel to and from the surrounded occupancies, the mode of travel, and other conditions reasonably necessary to preserve the National Forest Wilderness, [39 FR 31321, Aug. 28, 1974]

Issues that affect the wilderness character, visitors and MCID workers include federal dam safety requirements, the length of time required to complete the work, the feasibility of using traditional methods vs. motorized/mechanized methods, the level of impact created by access (trail vs. helicopter), and cost.

The following Minimum Requirements Worksheets are used to document the process to determine the minimum action necessary and reasonable to complete the project (access to Mill Lake Dam for proposed work).

Public comment on the proposed use of mechanical transport will be incorporated into the final decision.

Minimum Requirements Worksheets

STEP 1 – DETERMINIMG THE MINIMUM REQUIREMENTS FOR MOTORIZED EQUIPMENT AND MECHANIZED TRANSPORT TO Mill Lake Dam (A two-part process)

PART A – Minimum Requirement Key to making a determination on wilderness proposals

(Answering these questions will help determine the **minimum required** action in wilderness.)

<table>
<tr><th colspan="3">Guiding Questions</th><th></th><th colspan="3">Use the available space or additional sheets as necessary</th></tr>
<tr><td colspan="3" rowspan="4">Is this an emergency (i.e.. a situation that involves an inescapable urgency and temporary need for speed beyond that available by primitive means, such as fire suppression, health and safety of people, law enforcement efforts involving serious crime or fugitive pursuit, retrieval of the deceased or an immediate aircraft accident investigation)?</td><td rowspan="4"></td><td>Answer:</td><td>YES:</td><td>NO: X</td></tr>
<tr><td colspan="3" rowspan="3">Explain: The request for mechanized access to Mill Lake Dam is not due to an emergency situation. It is to repair an ongoing leakage problem around the outlet works pipe by slip-lining the existing metal pipe with a new pipe. These repairs would meet Federal Dam Safety requirements by eliminating the potential for piping, or internal erosion of the embankment material around the outlet pipe that can result in a dam failure. Piping caused by seepage is one of the leading causes of failure for embankment or earthfill dams. This project will address the deficiency of the deficiency of the deteriorated outlet pipe and reduce the risk of an emergency situation and potential failure from piping around the conduit.</td></tr>
<tr><td colspan="2">If Yes, then:</td><td>If No, then:</td></tr>
<tr><td colspan="2">Document rationale for line officer approval using the minimum tool form and proceed with action</td><td>⇓
Go to next question</td></tr>
<tr><td colspan="3"></td><td></td><td colspan="3"></td></tr>
<tr><td colspan="3" rowspan="3">Does the project or activity conflict with the stated wilderness goals, objectives and desired future conditions of applicable legislation, policy and management plans?</td><td rowspan="3"></td><td>Answer:</td><td>YES:</td><td>NO: X</td></tr>
<tr><td colspan="3" rowspan="2">The Wilderness Act, Forest Service Manual Direction (2320), the Bitterroot NF Forest Plan, the Selway-Bitterroot Wilderness General Management Direction, 1866/1891 Easement and Dam Safety Laws and Regulations list applicable legislation and policy. FSM 2326.1 lists conditions under which the use of motorized equipment or mechanical transport may be approved. This analysis indicates that three of the conditions is met. See the last page of the minimum requirements worksheet.</td></tr>
<tr><td colspan="2">If Yes, then:</td><td>If No, then:</td></tr>
<tr><td colspan="2">Do not proceed with the proposed project or activity.</td><td>⇓
Go to next question</td></tr>
</table>

Are there other less intrusive actions that should be tried first (i.e. signing, visitor education or information)?			**Answer:**	**YES:**	**NO: X**
If **Yes**, then:	If **No**, then:		**Explain:** The action is transport of equipment, materials, supplies and people to the dam. Other less intrusive actions would not fulfill the purpose of the project.		
Implement other actions using the appropriate process.	⇓ *Go to next question*				
Can this project or activity be accomplished outside of wilderness and still achieve its objectives (i.e. some group events)?			**Answer:**	**YES:**	**NO: X**
If **Yes**, then:	If **No**, then:		**Explain:** Mill Lake Dam is located in the Selway-Bitterroot Wilderness.		
Proceed with action outside of wilderness using the appropriate process.	⇓ *Go to next question*				
Is this project or activity subject to valid existing rights (i.e. a mining claim or right-of-way easement)?			**Answer:**	**YES: X**	**NO:**
If **Yes**, then:	If **No**, then:		**Explain:** See explanation on the introduction page as well as below.		
Proceed to minimum tool section of this document, STEP 2.	⇓ *Go to next question*				
Is there a special provision in legislation (the 1964 Wilderness Act or subsequent wilderness legislation) that allows this project or activity (i.e. maintenance of dams or water storage facilities with motorized equipment and mechanical transport or control of fire, insects and disease)?			**Answer:**	**YES: X**	**NO:**
If **Yes**, then:	If **No**, then:		**Explain**: The Wilderness Act does not specifically address mechanized access to wilderness dams. However, it does specifically address "valid occupancies" such as Mill Lake dam. In Section 4c it addresses access to all areas in Wilderness "[S]ubject to existing private rights...there shall be no use of motor vehicles [or] motorized equipment…in any such area." Section 5(b) states "In any case where… other valid occupancies are wholly within a designated forest wilderness area, the Secretary of Agriculture shall, by reasonable regulations consistent with the preservation of the area as wilderness, permit ingress and egress to such surrounding areas by means which have been or are being customarily enjoyed with respect to such areas similarly situated." Requests for access with mechanical transport are evaluated on a case-by-case basis, using Forest Service Manual direction and a Minimum Requirements Analysis.		
The proposed project or activity can be considered but it is not necessarily required just because it is mentioned in legislation. *Go to Part B, as needed.*	⇓ *Proceed to Part B, Responsive Questions*				

Minimum Requirements Worksheets

PART B – Determining the Minimum Requirement

EFFECTS ON WILDERNESS CHARACTER	REPONSIVE STATEMENT
How does the project or activity benefit the wilderness resource as a whole as opposed to maximizing one resource?	NA – The MCID has the right to access Mill Lake Dam for the reasonable use and enjoyment of these facilities. All project activities would occur within the MCID easement right-of-ways.
If this project or activity were not completed, what would be the beneficial and detrimental effects to the wilderness resource?	See above
How would the project or activity help ensure that human presence is kept to a minimum and that the area is affected primarily by the forces of nature instead of being manipulated by humans?	See above. The mode of transport chosen will significantly influence the length of time needed for access. Analysis indicates that mechanized round-trip transport would take approximately 4 -5 days with a total length of project time approximately 3-4 weeks. A combination of mechanized/non-mechanized round-trip transport to take in requested equipment/materials as well as packing in the grout material and mixing it on site would take 60-70 days with a total length of project time approximately 6-8 weeks. Helicopter trips would be reduced but stock trips along the trail would substantially be increased. In addition, the length of the project would also be increased. Impacts to the trail would also be increased. See following worksheets and appendixes addressing each alternative.
How would the project or activity ensure that the wilderness provides outstanding opportunities for solitude or a primitive and unconfined type of recreation (i.e. does the project or activity contribute to people's sense that they are in a remote place with opportunities for self-discovery, adventure, quietness, connection with nature, freedom, etc.)?	See above. The mode of transport chosen will influence effects to visitor experience by length of time required to transport equipment/supplies, to complete the project, and by number of encounters along the trail (traditional but requiring visitors to move off the trail and walk along horse manure) vs. sounds of helicopters (more disruptive to the "primitive" experience but no physical trail effects). Primary effects on visitor experience will be the actual work at Mill Lake Dam.

MANAGEMENT SITUATION		
What do your management plan, policy and legislation say to support proceeding with this project?	See Step 1 - Part A.	
How did you consider wilderness values over convenience, comfort, political, economic or commercial values while evaluating this project or activity?	See following worksheets and appendixes addressing each alternative.	
SHOULD WE PROCEED?	**YES: X** *Go to STEP 2*	**NO:** *Stop*

Minimum Requirements Worksheets

STEP 2 – DETERMINIMG THE MINIMUM TOOL
(The Minimum Tool Analysis)

Describe the alternatives. Be specific and provide detail.
Alternative 1*: No Action* Under this alternative, the Mill Creek Irrigation District would not be authorized helicopter access for the purpose of repairing their facility. Routine maintenance would be allowed to continue under the existing easement. Mill Lake Dam would remain in its present condition, which is not acceptable in regards to current federal dam safety laws and standards. The dam would continue to deteriorate and potentially threaten downstream forest resources and public safety.
Alternative 2: (MCID Proposal): ***Mechanized transport would be authorized for equipment or materials unreasonable to transport,(weight of pieces, size/shape, equipment sensitivity) with stock. Some materials and people may be transported by mechanized transport. The 40,500 lbs. of grout would be transported by mechanized transport. All other equipment, materials, supplies and people would be transported with stock. All use of motorized tools would be authorized.*** The MCID would use a combination of traditional transport (primarily with stock) and helicopter transport for equipment, materials and supplies. Some personnel may be transported to the dam by helicopter. Most people would access Mill Lake Dam by foot or with stock. The MCID would use motorized equipment at the dam to grout annular space between new insert pipe and the existing pipe. Helicopter transport would bring in the 13.5 cubic yards of grout from a reliable batching and mixing facility in the valley. Digging and moving rocks from around the outlet pipe would be done by non-motorized tools. Length of work period would be from 3 to 4 weeks. Number of days of helicopter traffic would be 4 to 5 days. Estimated 25 - 30 helicopter trips. Estimated 4 stock trips (each with 5 pack stock/one riding horse). All work would be completed in 2005.
Alternative 3: ***Mechanized transport would only be authorized for equipment unreasonable to transport, (weight of pieces, size/shape, equipment sensitivity) by stock. The 40,500 lbs. of grout, and all other equipment, materials, people, and supplies would be transported with stock. Onsite mixing of grout would occur. All use of motorized tools would be authorized*** The MCID would use mechanized transport for only the equipment unreasonable to haul up with stock. All other equipment, people, materials and supplies would be packed in by stock. The MCID would use motorized equipment at the dam to mix the grout material on site and pump the grout into the annular space between new insert pipe and the existing pipe. Approximately, 13.5 cubic yards of grout is needed to slip-line the pipe. Total weight estimated at 40,500 lbs. would be hauled in by stock and mixed on site. Digging and moving rocks from around the outlet pipe would be done by non-motorized tools. Length of work period would be 6-8 weeks. Number of days of helicopter traffic would be 3 days. Estimated 8 – 10 helicopter trips. Estimated 60-70 stock trips (each with 5 pack stock/1 riding horse). The quality of the grout would be compromised, and the work may not be completed in 2005.
Alternative Not Looked at in depth: ***No mechanized transport or motorized equipment would be authorized. All equipment, materials, supplies and people would be transported with stock.*** The MCID would use traditional transport and equipment to haul in all materials, supplies and personnel, mix the grout on site and slip line the outlet pipe. This would alter MCID's planned engineering designs, and would simply not meet state of practice engineering techniques. See Appendix C).
Alternative Not Looked At In Depth: ***Fusion Welding (HDPE Pipe*****)** This alternative requires helicopter transport of 3800 lb. Fusion welding machine and generator to weld sections of the new 92 foot long outlet pipe. The sections of pipe could be transported by stock; however, the fusion welding machine requires mechanized transport and motorized power source. There would also be increased costs to the irrigation district for the lease or purchase of this equipment. Because of the increased costs, preference for a single joint of pipe by the engineering representative for the irrigation district, and no benefit related to Wilderness impacts, this alternative was eliminated from consideration.

Alternative Not Looked At In Depth: ***PVC Pipe.*** PVC is not an acceptable piping material for high hazard earthfill embankments. It has typically been used on small low-head, low hazard dams, such as stock ponds. However, PVC is joined using a bell and spigot connection with a gasket. This type of joint can easily leak during normal settlement of an earthfill dam. This leakage would likely result in piping, or internal erosion, of the embankment materials around the outlet pipe. Piping failure due to excessive seepage through the dam that results in internal erosion of the embankment fill material is one of the leading causes of failure for earthfill dams. The other reason that PVC is typically not used in outlet works for high hazard dams is that the material becomes brittle with decreased temperature, and a point load, such as a rock in the embankment, could crack and fail the pipe. Therefore, the use of PVC pipe for the outlet work is not acceptable because its use in this application would result in an increased risk of failure for this high hazard dam.

Alternative Not Looked At In Depth: ***Breaching Mill Lake Dam.***
This alternative is outside the scope of Forest Service authority.

Economic, Logistical and Timing Considerations
Notes: • **Alternatives are still being evaluated. While costs may be revised, they are used here to indicate relative values.** • **The estimated transport, equipment and labor costs are NOT total project costs. Certain material, off-site logistics, insurance, fees and permits, and standard contingency mark-ups are not included in these comparative costs.** • **One season is approximately 60 days (August, September). Snow and weather conditions outside this timeframe limit work and productivity.** • **These timeframes do not thoroughly evaluate ways project pieces may overlap or ways additional support could speed work. They are used here to indicate relative values**

	Alt 1	**Alt 2**	**Alt 3**
Estimated Project Costs	**0.00**	**$50,000 to $60,000**	**$85,000 to $95,000**
Estimated days for mechanized access	**none**	**4-5**	**3**
Estimated time for project completion	**none**	**@ 3-4 Weeks**	**@ 6-8 Weeks**

*Opportunity Class – A hypothetical set of conditions that will be maintained or restored within wilderness. More than one opportunity class description is developed in order to reflect the varying levels of human-caused change, solitude, challenge, and management activities experience within the wilderness.

Biophysical Effects
Common to All Alternatives: The Mill Creek drainage is in Opportunity Class 2* and receives relatively moderate use. Opportunity Class 2 is characterized by an unmodified natural environment. Ecological and natural processes on some sites are slightly affected by the actions of users. Environmental impacts are restricted to minor loss of vegetation where camping occurs and along most travel routes. Impacts in a few areas persist from year to year, and are noticeable to a few visitors. The area around Mill Lake exceeds Forest Plan standards by the number of campsites that are too heavily impacted
Alternative 1 This alternative would have no effect on wilderness in the short term. However, in the long term, if the dam is not repaired there is the possibility of breach and subsequent destruction of vegetation, catastrophic soil movement, and stream channel scouring which would be an irreversible indicator of man's presence. A dam failure would also be expected to produce short term water quality and fishery degradation.
Alternative 2: Effects on fisheries, vegetation, sensitive plants and cultural resources would be low with air transport (unless a helicopter crashes – which has fuel spill and aircraft removal problems). Effects on management indicators or T&E species would be low. Effects to mountain goats and Peregrine Falcons disturbed by air transport would be increased. There would be temporary wildlife displacement but primary effects would occur during the work operations. Effects to the Mill Lake worker campsite would be minimal because extensive camps have also been used in recent repair projects. These campsite impacts are considered traditional and able to be mitigated.
Alternative 3: Helicopter effects would be the same as in Alternative 2. Possible effects on fisheries, vegetation, sensitive plants and cultural resources would be increased by stock impacts on Mill Creek Trail. The amount of time needed for transport and for work would be higher than in Alternative 2 (increasing wildlife displacement). Effects to the Mill Lake worker campsite would be higher than during recent projects due to longer project timeframes. There would be increased stock impacts to the Mill Creek Trail tread and drainage structures. Effects on campsites associated with stock transport would be increased compared to past work projects that used stock on-site (and included containment).

Social/Recreational/Experiential Effects
Common to All Alternatives: The Mill Creek drainage is in Opportunity Class 2 and receives relatively moderate use. Opportunity Class 2 is characterized by an unmodified natural environment. Ecological and natural processes on some sites are slightly affected by the actions of users. Environmental impacts are restricted to minor loss of vegetation where camping occurs and along most travel routes. Some sign of human modification and visitors can expect to see some human impacts that persist from year to year. The area around Mill Lake exceeds Forest Plan standards by the number of campsites that are too heavily impacted. Mill Creek Trail # 364 is a popular stock and foot trail.
Alternative 1: This alternative would have no effect on the visitor's expectations of naturalness, remoteness and solitude in the short term. However, in the long term, if the dam is not repaired there is the possibility of breach and subsequent destruction of vegetation, catastrophic soil movement, and drainage scouring which would be an irreversible indicator of man's presence.
Alternative 2: Visitor expectations of naturalness, remoteness and solitude would be impacted by the sight and sound of helicopters, by landings at the lake (considered an intrusion of wilderness character); by encounters with motorized equipment at the lake; and by camping restrictions associated with the work project. The physical effects of transport would total approximately **4-5 days** and the work project would take approximately **3-4 weeks** to complete.
Alternative 3: Visitor expectations of naturalness, remoteness and solitude would be impacted by the sight and sound of helicopters, by landings at the lake (reduced slightly from Alternative 2); by encounters with motorized equipment at the lake; and by camping restrictions associated with the work project. Effects to visitor experience would be increased by trail encounters with stock trains. The physical effects of transport would total approximately **60-73 days (3 days with helicopters and 60-70 days with stock** – NOT done simultaneously because of site constrictions) and the work project would take approximately **6-8 weeks** to complete.
Societal/Political Effect
Common To All Alternatives: The MCID is liable for damages associated with dam failure, particularly if the dam owner is determined to be negligent. Negligence is the lack or failure of actions that a reasonable dam owner would perform in constructing, maintaining, and operating a dam. The dam owner's engineering representative is also accountable for complying with dam safety laws and regulations, and violation of such requirements could also constitute negligence. Dams have failed in Montana with resulting damage claims decided by the courts. Damages from a dam failure can be substantial. Downstream devastation could include loss of life, personal injuries, property damage, and loss of storage for irrigation.
Health and Safety Concerns
Common to All Alternatives: If the deficiency of the outlet pipe is not completed to acceptable standards within a reasonable timeframe, there is an increased risk of failure caused by piping around the outlet conduit, which is one of the leading causes of failure for earthfill dams. There is a risk of loss of life if Mill Lake Dam fails because it is a high hazard dam. As the dam owner, MCID is the responsible party and can be held liable for damages if they are negligent in repairing the deteriorated outlet works.
Alternative 1: This alternative would have no effect in the short term. However, in the long term, if the dam is not repaired there is the possibility of collapse of the deteriorated outlet pipe leading to piping and dam failure. Several residences and buildings could be flooded as well as Highway 93 near Mill Creek. Consequences could include loss of life, economic loss to residents and property owners, and damage to public and private natural and economic resources.
Alterative 2: There would be risk of severe injury or death associated with helicopter use. There would be some risk associated with use and transport of hazardous materials (to on-site workers, visitors and down-stream properties). There would be some risk of moderate or severe injury associated with stock use. This alternative corrects the dam safety deficiencies within a reasonable timeframe utilizing accepted engineering practices.
Alterative 3: There would be risk of severe injury or death associated with helicopter use (but slightly less than in Alternative 2). There would be some risk associated with use and transport of hazardous materials (to on-site workers, visitors and down-stream properties). Risk of stock and construction-related injuries in this alternative would be higher than in Alternative 2. This alternative does not meet acceptable quality control for the batching and mixing of the grout utilizing an approved facility (based on recommendations from MCID's engineering representative).

Formulate a preferred action. Be specific and describe in detail below.

Alternative 2 meets three of the conditions listed in FSM, WO Amendment 2300-90-1, 2326.1- Conditions Under Which Use May Be Approved. Allow the use of motorized equipment or mechanical transport only for:

- **Emergencies or inescapable urgency and temporary need for speed beyond that available by primitive means. – As shown in Step 1 part A the request for mechanized access to Mill Creek Dam is not due to an emergency situation. It is to repair an ongoing leakage problem around the outlet works pipe. These repairs would correct deficiencies affecting the integrity of the structure by reducing the potential for piping, or internal erosion of the embankment material around the outlet pipe that can result in a dam failure. Piping and seepage is one of the leading causes of failure for embankment or earth-fill dams. By completing this work the dams structural integrity would be improved and the risk of an emergency situation would be reduced.**
- **Access to surrounded State and private lands and valid occupancies (FSM 2326.13)**
- **To meet minimum needs for protection and administration of the area as wilderness, only as follows: (b.) An essential activity is impossible to accomplish by non-motorized means because of such factors as time or season limitations, safety, or other material restrictions.**

Alternative 2 corrects the deficiency associated with the outlet works in a reasonable timeframe using to prevent an emergency condition and would affect visitor experience for the shortest amount of time (although this would be offset by the affects of motorized & mechanized use).

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Appendix G

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Appendix H

Types of Actions Analyzed for the Mill Lake Dam 2005 Project

Connected Actions

Connected actions are those actions which are closely related and therefore should be discussed in the same environmental impact statement. Actions are connected if they:

- automatically trigger other actions which may require environmental analysis,
- cannot or will not proceed unless other actions are taken previously or simultaneously, or
- are independent parts of a larger action and depend on the larger actions for their justification.

The proposed action includes those activities necessary to fulfill the identified purpose and need as well as all connected actions identified in the alternatives described in Chapter 2. The proposed action includes the Bitterroot National Forest authorizing sufficient helicopter trips to allow for work to be done at Mill Lake dam and the required terms, conditions and mitigation measures required during access and work periods.

Connected actions include work to be done at the dam site, which is described in Appendix B.

Cumulative Actions

Cumulative actions are those actions, which when viewed with past actions, other present actions, and reasonably foreseeable actions, may have cumulatively significant impacts and therefore should be discussed in the same environmental analysis document. Past, present, and reasonably foreseeable actions are activities that have already occurred, are currently occurring, or are likely to occur in the vicinity of the project area and may contribute cumulative effects. The past and present activities and natural events have contributed to creating the existing condition, as described in the Affected Environment in the EA. These activities, as well as reasonably foreseeable activities, may produce environmental effects on issues or resources relevant to the proposal. Therefore, the past, present, and reasonably foreseeable activities have been considered in the cumulative effects analysis for each resource area.

Mill Creek Drainage and Vicinity:

Past Actions inside wilderness only:
Mill Lake Dam - Reservoir Right of Way dam located and used in 1895
Mill Lake Dam - Present dam construction 1907
Mill Lake Dam - Major rehabilitation/maintenance in 1922, 1944, 1959-60-61, 1964 and 1991-1992
Mill Lake Dam - Geophysical Survey – 2001 - use of helicopters and motorized equipment

Mill Lake Dam - Dam Repair – Temporary repair 2001, 2002, use of helicopters and motorized equipment
Mill Lake Dam - Dam Dye tracing test- 2002
Mill Lake Dam - Geotechnical Investigation 2003, use of helicopters, motorized equipment
Construction of dams at Hauf Lake and Sears Lake.
Construction of dam at Lockwood Lake (presently breached)

Past Actions that may be inside or outside of wilderness:
Fires – From 1970 to 1997, records of 11 fire starts
Small portion of the Blodgett Campground fire in 2000 was in Mill Creek drainage, creating a mosaic of burn intensities in the lower portion of the drainage
Salvage logging operations to the north of Mill Creek in 2001 and 2002
Post 2000 fire activities Best Management Practices were reviewed , and except for one culvert, were deemed adequate or better.
Construction of trails and road system
Shooting and the use of DDT

Present and On going Actions inside wilderness only
Mill Lake Dam Routine Maintenance – Some motorized equipment, draft horses have been used to move debris
All Dams: Mill Lake, Hauf Lake, Sears Lake
- Dam Operation – water stored and released
- Dam Inspections
- Dam Maintenance

Maintenance and Operation Access – Foot or stock
Mill Lake Dam: Installation of Early Warning System inside wilderness 2002
Sears Lake Dam Maintenance: Motorized equipment 2003, Hand saw 2004

Present and On going Actions that may be inside or outside of wilderness:
Mill Creek trail was realigned in 2003 and 2004 and work will continue into 2005.
Recreation activities including camping at Mill Lake, hiking and stock use
Campground and Trailhead facilities
Fire occurrence
Increased fire suppression resulting in more cover and less forage for wildlife
Increased human access and increased hunting season mortality
Ditch irrigation diversions on National Forest and private lands
Unauthorized ATV trails at the Forest Service and private land boundary
Several private landowners have worked on a channel restoration project
Limited amounts of water reach the Bitterroot River during summer because of diversions on private land
Housing development close to Mill Creek. Currently there are no county setback rules. State requirements are to build outside of the high water mark or get a 310 permit.
Road building, agriculture, channelization and other rural and suburban activities are occurring on private land

Housing development on private lands - 44.2 % ten year rate of growth in population in Ravalli County from 1990 -2000

Reasonably Foreseeable Actions Only in wilderness
Future maintenance on dams
Further repair work on Mill Lake Dam

Reasonably Foreseeable Actions that may be inside or outside of wilderness:
Trail maintenance
Continuing recreation use
Hazardous fuel reduction project near the Forest Service and private land boundary
Prescribed fire
Spraying herbicides along the roads and trails to control noxious weeds